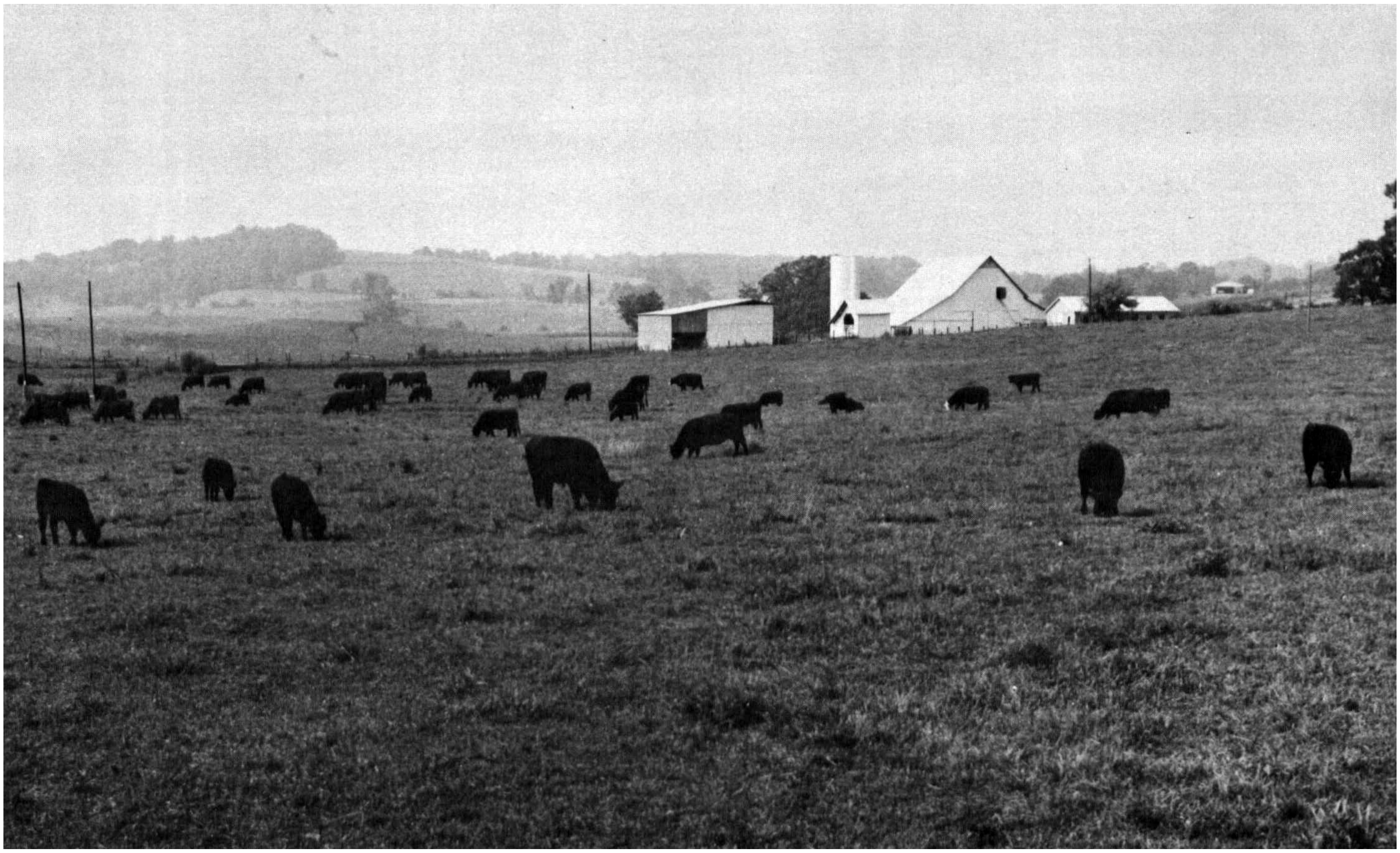
SOIL SURVEY OF

Monroe County, Tennessee



United States Department of Agriculture
Soil Conservation Service and Forest Service
in cooperation with
University of Tennessee
Agricultural Experiment Station

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this survey was completed in the period 1967-73. Soil names and descriptions were approved in 1974. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1973. This survey was made cooperatively by the Soil Conservation Service and the Forest Service in cooperation with the University of Tennessee Agricultural Experiment Station. It is part of the technical assistance furnished to the Monroe County Soil Conservation District.

Soil maps in this survey may be copied without permission, but any enlargement of these maps could cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All of the soils of Monroe County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the areas if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Index to Mapping Units" on page ii lists all of the soils in the county by map symbol and shows the page where each soil is described. The capability unit and woodland group to which each soil has been assigned are specified at the end of the soil description.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions.

Foresters and others can refer to the section "Woodland," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Wildlife."

Community planners and others can read about soil properties that affect the choice of sites for recreation areas in the section "Recreation."

Engineers and builders can find, under "Engineering," tables that estimate soil properties and information about soil features that affect engineering practices.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of Soils."

Newcomers in Monroe County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the information about the county given in the section "General Nature of the County."

***Cover:* Tall fescue pasture in Monroe County. Emory silt loam is in the foreground. Talbott silt loam is on the adjacent slopes.**

Contents

Page

Index to mapping units ii
Summary of tables iii
General nature of the county 1
- Markets and industries 1
- Farming 1
- Climate 2

How this survey was made 3
General soil map 4
1. Fullerton-Minvale-Greendale association 4
2. Decatur-Dewey-Emory association 5
3. Litz-Sequoia association 5
4. Talbott-Gladeville association 6
5. Tellico-Alcoa-Neubert association 7
6. Dunmore-Dewey association 8
7. Dandridge association 9
8. Statler-Staser-Transylvania association 9
9. Calvin association 10
10. Wallen-Jefferson-Ramsey association 10
11. Ranger-Citico-Fletcher association 10
12. Sylco-Citico-Brookshire association 12
13. Ditney-Brookshire-Jeffrey association 12

Descriptions of the soils 13
- Alcoa series 13
- Allegheny series 15
- Allen series 16
- Altavista series 17
- Atkins series 17
- Beason series 18
- Bland series 18
- Brookshire series 19
- Calvin series 20
- Cataska series 21
- Chagrin series 21
- Christian series 22
- Citico series 23
- Dandridge series 23
- Decatur series 24
- Dewey series 25
- Ditney series 27
- Dunmore series 28
- Dunning Series 30
- Emory series 31
- Etowah series 31
- Farragut series 32
- Fletcher series 33
- Fullerton series 34
- Gladeville series 35
- Greendale series 36
- Hamblen series 36
- Hartsells series 37
- Holston series 37
- Jefferson series 38
- Jeffrey series 39
- Leadvale series 40
- Linker series 40
- Litz series 42
- Lobdell series 43
- Minvale series 44
- Montevallo series 44
- Neubert series 45
- Newark series 45
- Philo series 46
- Pope series 46
- Purdy series 47
- Ramsey series 47
- Ranger series 48
- Sequatchie series 49
- Sequoia series 49
- Shelocta series 50
- Shouns series 51
- Spivey series 52
- Staser series 52
- Statler series 53
- Steekee series 53
- Sylco series 54
- Talbott series 55
- Tellico series 56
- Transylvania series 58
- Unicoi series 59
- Wallen series 59
- Waynesboro series 60
- Whitwell series 61

Use and management of the soils 62
- General principles of soil management 62
- Capability grouping 62
- Estimated yields 63
- Woodland 63
- Wildlife 74
- Engineering 79
  - Engineering classification systems 79
  - Soil properties significant in engineering 79
  - Engineering interpretations 97
- Recreation 99

Formation and classification of soils 99
- Factors of soil formation 99
  - Climate 99
  - Plant and animal life 103
  - Parent material 103
  - Relief 103
  - Time 104
- Classification of the soils 104

References 105
Glossary 106

Issued October 1981

Index to Mapping Units

Page
AaB—Alcoa loam, 2 to 5 percent slopes 13
AaC—Alcoa loam, 5 to 12 percent slopes 13
AaD—Alcoa loam, 12 to 20 percent slopes 15
AcC3—Alcoa clay loam, 5 to 12 percent slopes, severely eroded 15
AcD3—Alcoa clay loam, 12 to 20 percent slopes, severely eroded 15
Ag—Allegheny loam 16
AnC—Allen loam, 5 to 12 percent slopes 16
AnD—Allen loam, 12 to 25 percent slopes 17
As—Altavista silt loam 17
At—Atkins silt loam 18
Ba—Beason silt loam 18
BdD—Bland silt loam, 10 to 25 percent slopes 19
BdE—Bland silt loam, 25 to 50 percent slopes 19
BnE—Bland-Rock outcrop complex, 25 to 50 percent slopes 19
BrE—Brookshire loam, 20 to 40 percent slopes 20
CaD—Calvin silt loam, 5 to 20 percent slopes 20
CaE—Calvin silt loam, 20 to 40 percent slopes 20
CcF—Cataska-Rock outcrop complex, 35 to 75 percent slopes 21
Cg—Chagrin silt loam 22
ChC—Christian loam, 3 to 12 percent slopes 22
ChD—Christian loam, 12 to 25 percent slopes 22
CnD3—Christian clay loam, 12 to 25 percent slopes, severely eroded 22
CtE—Citico channery silt loam, 20 to 40 percent slopes 23
DaD—Dandridge shaly silty clay loam, 5 to 20 percent slopes 24
DaE—Dandridge shaly silty clay loam, 20 to 35 percent slopes 24
DaF—Dandridge shaly silty clay loam, 35 to 60 percent slopes 24
DcB—Decatur silt loam, 2 to 5 percent slopes 24
DcC—Decatur silt loam, 5 to 12 percent slopes 25
DcD2—Decatur silt loam, 12 to 20 percent slopes, eroded 25
DdC3—Decatur silty clay loam, 5 to 12 percent slopes, severely eroded 25
DdD3—Decatur silty clay loam, 12 to 20 percent slopes, severely eroded 25
DeB—Dewey silt loam, 2 to 5 percent slopes 26
DeC—Dewey silt loam, 5 to 12 percent slopes 27
DeD2—Dewey silt loam, 12 to 20 percent slopes, eroded 27
DgC3—Dewey silty clay loam, 5 to 12 percent slopes, severely eroded 27
DgD3—Dewey silty clay loam, 12 to 20 percent slopes, severely eroded 27
DhD—Ditney loam, 12 to 25 percent slopes 28
DhF—Ditney loam, 25 to 60 percent slopes 28
DmB—Dunmore silt loam, 2 to 5 percent slopes 28
DmC—Dunmore silt loam, 5 to 12 percent slopes 29
DmD2—Dunmore silt loam, 12 to 20 percent slopes, eroded 29
DmE2—Dunmore silt loam, 20 to 35 percent slopes, eroded 29
DnC3—Dunmore silty clay loam, 5 to 12 percent slopes, severely eroded 30
DnD3—Dunmore silty clay loam, 12 to 20 percent slopes, severely eroded 30
Du—Dunning silty clay loam 30
Em—Emory silt loam 31
EtB—Etowah silt loam, 2 to 5 percent slopes 31
EtC—Etowah silt loam, 5 to 12 percent slopes 32
EtD—Etowah silt loam, 12 to 20 percent slopes 32
FaC2—Farragut silt loam, 5 to 12 percent slopes, eroded 32
FgD3—Farragut silty clay, 12 to 20 percent slopes, severely eroded 32
FhC—Fletcher silt loam, 5 to 12 percent slopes 33
FhD—Fletcher silt loam, 12 to 20 percent slopes 33

Page
FtC—Fullerton cherty silt loam, 5 to 12 percent slopes 34
FtD—Fullerton cherty silt loam, 12 to 20 percent slopes 34
FtE—Fullerton cherty silt loam, 20 to 40 percent slopes 34
GdD—Gladeville-Rock outcrop complex, 5 to 25 percent slopes 35
Gr—Greendale silt loam 36
Ha—Hamblen silt loam 37
HeC—Hartsells fine sandy loam, 5 to 15 percent slopes 37
HoC—Holston loam, 3 to 12 percent slopes 38
JeC—Jefferson fine sandy loam, 3 to 12 percent slopes 38
JeD—Jefferson fine sandy loam, 12 to 25 percent slopes 38
JeE—Jefferson fine sandy loam, 25 to 50 percent slopes 39
JfD—Jefferson cobbly fine sandy loam, 12 to 25 percent slopes 39
JfE—Jefferson cobbly fine sandy loam, 25 to 50 percent slopes 39
JyD—Jeffrey cobbly loam, 12 to 25 percent slopes 40
JyF—Jeffrey cobbly loam, 25 to 60 percent slopes 40
LeB—Leadvale silt loam, 2 to 5 percent slopes 40
LkC—Linker loam, 5 to 12 percent slopes 41
LtC—Litz shaly silt loam, 5 to 12 percent slopes 42
LtD—Litz shaly silt loam, 12 to 20 percent slopes 42
LtD3—Litz shaly silt loam, 12 to 20 percent slopes, severely eroded 42
LtE—Litz shaly silt loam, 20 to 35 percent slopes 43
LY—Litz and Sequoia soils, gullied 43
Lz—Lobdell silt loam 43
MnB—Minvale silt loam, 2 to 5 percent slopes 44
MnC—Minvale silt loam, 5 to 12 percent slopes 44
MtE—Montevallo shaly silt loam, 12 to 30 percent slopes 45
Ne—Neubert loam 45
Nk—Newark silt loam 46
Ph—Philo silt loam 46
Po—Pope loam 47
Pu—Purdy silt loam 47
RaF—Ramsey-Rock outcrop complex, 20 to 70 percent slopes 48
RgD—Ranger channery silt loam, 12 to 25 percent slopes 48
RgF—Ranger channery silt loam, 25 to 60 percent slopes 48
Sa—Sequatchie loam 49
SeB—Sequoia silt loam, 2 to 5 percent slopes 49
SeC2—Sequoia silt loam, 5 to 12 percent slopes, eroded 50
SeD2—Sequoia silt loam, 12 to 20 percent slopes, eroded 50
SgC3—Sequoia silty clay, 5 to 12 percent slopes, severely eroded 50
SgD3—Sequoia silty clay, 12 to 20 percent slopes, severely eroded 50
ShC—Shelocta silt loam, 3 to 12 percent slopes 51
ShD—Shelocta silt loam, 12 to 25 percent slopes 51
SnD—Shouns silt loam, 12 to 25 percent slopes 52

SpF—Spivey cobbly loam, 20 to 60 percent slopes 52
Ss—Staser loam 53
St—Statler loam 53
SvF—Steekee loam, 20 to 50 percent slopes 54
SyF—Sylco channery silt loam, 25 to 65 percent slopes 54
TaC2—Talbott silt loam, 5 to 12 percent slopes, eroded 55
TaD2—Talbott silt loam, 12 to 20 percent slopes, eroded 55
TbC3—Talbott clay, 5 to 12 percent slopes, severely eroded 55
TbD3—Talbott clay, 12 to 20 percent slopes, severely eroded 56
TcD—Talbott-Rock outcrop complex, 5 to 20 percent slopes 56
TcE—Talbott-Rock outcrop complex, 20 to 40 percent slopes 56
TeD—Tellico loam, 12 to 20 percent slopes 57
TeE—Tellico loam, 20 to 35 percent slopes 57
TeF—Tellico loam, 35 to 60 percent slopes 57
ToD3—Tellico clay loam, 12 to 20 percent slopes, severely eroded 57
ToE3—Tellico clay loam, 20 to 35 percent slopes, severely eroded 57
TS—Tellico and Dewey soils, gullied 57
Ty—Transylvania loam 59
UcF—Unicoi cobbly loam, 30 to 65 percent slopes 59
WaF—Wallen gravelly fine sandy loam, 20 to 60 percent slopes 60
WbB—Waynesboro loam, 2 to 5 percent slopes 60
WbC—Waynesboro loam, 5 to 12 percent slopes 60
WbD—Waynesboro loam, 12 to 20 percent slopes 60
WbE—Waynesboro loam, 20 to 35 percent slopes 61
WnC3—Waynesboro clay loam, 5 to 12 percent slopes, severely eroded 61
WnD3—Waynesboro clay loam, 12 to 20 percent slopes, severely eroded 61
Wt—Whitwell loam 62

Summary of Tables

General Nature of the County

Page
Rainfall data at four stations in Monroe County, Tennessee (Table 1) 2
Temperature data (Table 2) 2
Probabilities of last freezing temperatures in spring and first in fall (Table 3) 3

Descriptions of the Soils

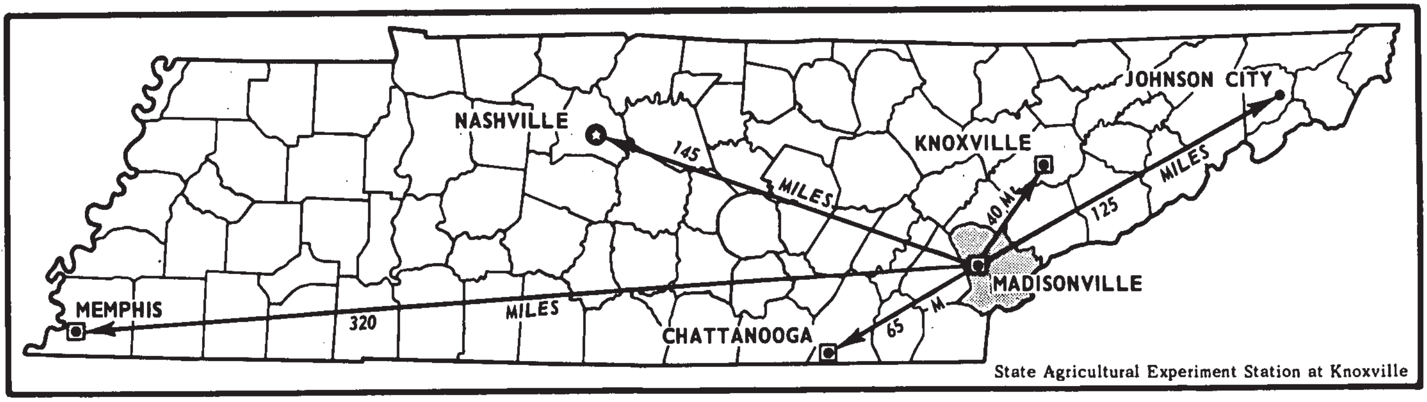
Approximate acreage and proportionate extent of the soils (Table 4) 14

Use and Management of the Soils

Estimated average acre yields of the principal crops under two levels of management (Table 5) 64
Potential woodland productivity and factors in management (Table 6) 66
Suitability of soils for elements of wildlife habitat and kinds of wildlife (Table 7) 76
Estimated engineering properties of the soil (Table 8) 80
Interpretations of engineering properties (Table 9) 88
Limitations for recreational development (Table 10) 100

Formation and Classification of Soils

Soil series classified by higher categories (Table 11) 105


NASHVILLE
KNOXVILLE
JOHNSON CITY
MEMPHIS
CHATTANOOGA
MADISONVILLE
145 MILES
40 MI.
125 MILES
320 MILES
65 M.
State Agricultural Experiment Station at Knoxville

Location of Monroe County in Tennessee.

SOIL SURVEY OF MONROE COUNTY, TENNESSEE

By Willam G. Hall and Bedford W. Jackson, Soil Conservation Service, and
Theodore R. Love, Forest Service

United States Department of Agriculure, Soil Conservation Service and
Forest Service, in cooperation with University of Tennessee Agricultural
Experiment Station

MONROE COUNTY is in the southeastern part of Tennessee (see facing page). It is bordered by McMinn and Loudon Counties on the west, by Polk and McMinn Counties on the south, and by North Carolina on the east. The Little Tennessee River and Loudon County form the northern boundary. Madisonville, the county seat, is about 30 miles southwest of Maryville and 50 miles northeast of Cleveland. The total area is about 422,400 acres, or 660 square miles.

The county lies within the Great Valley of East Tennessee in the western part and the Unaka Mountains in the eastern part. The western part is an area of valleys and ridges. Long, high ridges separated by narrow valleys extend throughout the county in a southwest-northeast direction. Ridgetops are generally 200 to 500 feet higher than the valleys. Elevations at the highest parts of the ridges range from 750 to 1,250 feet above sea level.

The eastern part of the county, which is in the Unaka Mountains, ranges from 1,000 to 5,000 feet in elevation. High narrow ridgecrests, steep side slopes, and narrow meandering drainageways characterize this area. The western part of the Unaka Mountains is less steep than the eastern part. Elevations range from 1,000 to 2,500 feet.

The county is drained mainly by the Little Tennessee River and its tributaries. Parts of Chilhowee Lake, Calderwood Lake, and the proposed Tellico Lake are in Monroe County on the Little Tennessee River.

General Nature of the County

Monroe County, named for President James Monroe, was formed from a part of North Carolina territory on November 13, 1819 (*3*).[1] When released by North Carolina, it became known as Territory South of the Ohio. The Indians released the claimed territory in a treaty known as the Hiwassee Purchase. This purchase involved the area known as Monroe and McMinn Counties. John C. Calhoun negotiated the treaty to form Monroe County.

Early settlers came from the upper part of eastern Tennessee, North Carolina, Virginia, and Georgia. The town of Tellico was established in 1822 and shortly thereafter became the county seat. The name was changed from Tellico to Madisonville in 1830.

The early settlers first cleared the more nearly level areas of the valley, which were dominantly in hardwoods. Since then about half of the county has been cleared, but some has reverted to woodland.

In 1970, according to the U.S. Bureau of Census, Monroe County had a population of 23,475. Sweetwater, the largest town, had a population of 4,340 and Madisonville a population of 2,614. The other two larger towns had a combined population of 1,300.

Markets and Industries

Sweetwater and Madisonville are the main trading centers in Monroe County. Other trading centers are Athens, Maryville, and Knoxville in nearby counties.

Crops, livestock and livestock products, and nonfarm employment furnish a large part of the county income. Monroe County has a wide variety of industries that employ from 5 to more than 250 people. Garment factories in both of the larger towns are the only industries that employ as many as 250 people. There are 14 firms with more than 19 employees, and eight are either in the textile industry or the apparel industry. Most of the employees are women who are supplementing the family income. Other manufacturing firms providing a major source of employment are food processing and distribution, fabricated metal, furniture and fixtures, and lumber and wood products for housing.

Two-thirds of the county is forested. Many people are employed by various companies that cut and saw lumber and construct homes.

There is also a local livestock market and at least three meat processing plants in the county.

Much of the local labor force is employed outside the county at the Atomic Energy Commission in Anderson and Roane Counties, the Aluminum Company of America in Blount County, and various other industries in Loudon and McMinn Counties.

Farming

About 40 percent of Monroe County is farms. In 1969, according to the U.S. Bureau of Census, there were 1,553 farms. The average size is 109 acres. Most farms are less than 50 acres. About 94 percent of these farms were operated by owners, but only 65 percent of the farmers were classified as full time.

---

[1] Italic numbers in parentheses refer to References, p. 105.

The largest source of farm income is derived from livestock, which is mostly from the sale of beef cattle and dairy products. Tobacco is the main cash crop. Corn, soybeans, and vegetables are also grown. Pasture and hay occupy the largest total acreage. The main pasture and hay plants are tall fescue, orchardgrass, lespedeza, white clover, and red clover.

Climate

Monroe County receives abundant annual rainfall. Winter is mild, and summer is warm. The climate is influenced mainly by cold air currents moving south from Canada and warm, moist air currents moving north from the Gulf of Mexico. These alternating currents frequently bring sharp daily changes in weather and are mainly responsible for seasonal variations.

Rainfall.—Table 1 presents data on rainfall from four stations in the county. As shown in this table, rainfall increases with increasing elevation. The Great Valley part of the county, represented by the stations at Riddles Store and McGhee, receives a little more than 50 inches of rainfall annually. The foothills of the mountains, represented by the station at Cockers Creek, receive 56 inches and the higher parts of the mountains, represented by the station at Stratton Meadows, receive about 78 inches. Thus, the rainfall at higher elevations is about 25 inches more annually than it is at lower elevations.

The greatest amount of rain generally falls in winter and in spring. A secondary maximum occurs late in spring and early in summer as the result of thunderstorm activity. Rainfall generally is lightest late in summer and early in fall. In all seasons there are periods of dry weather and periods in which rainfall is plentiful. Periods of excessive rainfall also occur in all seasons.

Temperature.—The temperature data in table 2 for Athens in McMinn County, which joins Monroe County along the western boundary, are representative of the Great Valley part of Monroe County. Long periods of very hot or very cold weather are unusual. Occasional periods of mild temperatures occur almost every winter, and occasional periods of cool, dry weather break up stretches of hot humid weather in summer. The greatest change in the average daily maximum and minimum temperature is during October and November, and again in February and March, when cold air moves south across the State.

Temperatures in the mountains range from about 2 degrees cooler in the lower parts to about 8 degrees cooler in the higher parts than those in the Great Valley.

TABLE 2.—*Temperature data*

[Athens Station, McMinn County, Tenn., for the period 1962-73, elevation 940 feet. Data furnished by National Climatic Center, Asheville, N. C.]

Month	Temperature		
	Average daily maximum	Average daily minimum	Average
	°F	*°F*	*°F*
January	47.6	24.2	35.5
February	48.3	24.6	36.5
March	59.8	34.6	47.2
April	70.9	45.2	58.1
May	78.7	52.1	65.5
June	85.0	60.5	72.8
July	87.0	63.8	75.4
August	86.7	62.9	74.8
September	82.3	57.5	69.9
October	72.6	44.6	58.6
November	59.7	34.9	47.3
December	50.3	26.0	39.4
Year	69.1	44.9	57.0

TABLE 1.—*Rainfall data at four stations in Monroe County, Tenn.*

[Data furnished by John M. Soileau, Research Soil Scientist, Tennessee Valley Authority]

Month	Riddles Store[1] elevation 1,030 feet period of record 1939–73	McGhee[2] elevation 930 feet period of record 1905–73	Cockers Creek[2] elevation 1,650 feet period of record 1934–73	Stratton Meadows[2] elevation 4,640 feet period of record 1935–73
	Inches	*Inches*	*Inches*	*Inches*
January	5.34	5.22	5.69	7.92
February	5.53	5.19	5.74	7.55
March	5.72	5.61	6.24	7.94
April	4.14	4.35	4.77	6.68
May	3.60	3.88	4.12	5.48
June	3.74	3.89	4.37	6.45
July	5.55	5.06	5.67	8.21
August	3.69	3.82	4.57	6.11
September	3.40	2.70	3.05	4.40
October	2.87	2.64	2.86	4.05
November	4.00	4.08	4.29	5.99
December	4.99	4.42	4.85	6.77
Year	52.6	50.9	56.2	77.6
Highest year	67.5	70.7	72.7	114.7
Lowest year	36.7	35.9	42.9	55.8

[1] Station is in valley part of county.

[2] Station is in mountainous part of county.

The average dates of the last freezing temperature in spring and the first in fall at Athens is April 16 and October 23, respectively (see table 3). The average growing season is 188 days.

Storms.—Severe storms are infrequent in Monroe County. The area is too far inland to experience damage from tropical storms. Hailstorms at a given locality occur about once or twice a year. Thunderstorms occur on about 56 days per year. Minor windstorms, often associated with thunderstorms, cause scattered local damage in the county a few times each year.

Humidity, wind, and clouds.—The average annual humidity in the county is estimated to be about 70 percent. The relative annual humidity in the county is estimated to be about 70 percent. The relative humidity throughout the day generally varies inversely with the temperature and is, therefore, highest early in the morning and lowest early in the afternoon. There is also an annual variation in relative humidity; the average daily variation is highest in winter and lowest in spring.

The prevailing wind direction for each month of the year is from the south, and the average windspeed is about 7 miles per hour. The wind direction changes frequently. The average monthly windspeed ranges from about 5 miles per hour in August to about 8 miles per hour in February through April. Windspeeds are 3 miles per hour or less about 14 percent of the time, 4 to 12 miles per hour 60 percent, 13 to 24 miles per hour 25 percent, and 25 miles per hour or higher about 1 percent. Winds are usually lightest during early morning hours and strongest early in the afternoon.

Cloud cover is less than 0.6 on the average between sunrise and sunset. Cloud cover ranges from about 0.7 in January to about 0.5 in October. As a result, sunshine is abundant, especially during the growing season when it averages slightly more than 60 percent of the total amount possible.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soil are in Monroe County, where they are located, and how they can be used. The soil scientists went into the county knowing they likely would find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes; the size and speed of streams; the kinds of native plants or crops; the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey (*7*).

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Decatur and Newark, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface layer and in slope, stoniness, or some other characteristic that affects the use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Decatur silt loam, 5 to 12 percent slopes, is one of several phases within the Decatur series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing

TABLE 3.—*Probabilities of last freezing temperatures in spring and first in fall*

[Athens, McMinn County, Tenn., for the period 1962-73. Prepared by National Climatic Center, Asheville, N. C.]

Probability	Dates for given probability and temperature				
	16° F or lower	20° F or lower	24° F or lower	28° F or lower	32° F or lower
Spring:					
1 year in 10 later than	March 16	March 30	April 7	April 14	May 2
2 years in 10 later than	March 9	March 23	April 2	April 10	April 26
5 years in 10 later than	February 25	March 10	March 24	April 3	April 16
Fall:					
1 year in 10 earlier than	November 20	November 8	October 30	October 21	October 9
2 years in 10 earlier than	November 28	November 14	November 4	October 26	October 14
5 years in 10 earlier than	December 12	November 27	November 15	November 3	October 23

boundaries accurately. The soil map in the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of the farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series, or of different phases within one series. Two such kinds of mapping units are shown on the soil map of Monroe County: soil complexes and undifferentiated groups.

A soil complex consists of areas of two or more soils, so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. Generally, the name of a soil complex consists of the names of the dominant soils, joined by a hyphen. Ramsey-Rock outcrop complex, 20 to 70 percent slopes, is an example.

An undifferentiated group is made of two or more soils that could be delineated individually, but are shown as one unit because, for the purpose of the soil survey, there is little value in separating them. The pattern and proportion of soils are not uniform. An area shown on the map may be made up of only one of the dominant soils, or of two or more. An undifferentiated soil group in Monroe County is Tellico and Dewey soils, gullied.

While a soil survey is in progress, samples of soils are taken as needed for laboratory measurements and for engineering tests. Existing ratings of suitabilities and limitations, or interpretations, of the soils are field tested and modified as necessary during the course of the survey, and new interpretations are added to meet local needs. This is done mainly through field observations of behavior of different kinds of soil for different uses under different levels of management. Also, data are assembled from other sources, such as test results, records, field experience, and other information available from State and local specialists. For example, data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so to be readily useful to different groups of users, among them farmers, managers of woodland, engineers, planners, developers and builders, homebuyers, and those seeking recreation. Presenting the detailed information in an organized, understandable manner is the purpose of this publication.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Monroe County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area, or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field or for selecting the exact location of a road, building, or similar structure because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect their management.

The thirteen soil associations in Monroe County are described on the pages that follow.

1. Fullerton-Minvale-Greendale association

Hilly and steep cherty soils, more than 5 feet deep over limestone, on high hills and deep, nearly level to rolling soils on foot slopes and bottom land

This association is high, rounded hills that are dissected by numerous crooked drainageways. The drainageways, or hollows, are mainly narrow and V-shaped at the head, but widen into narrow strips of level bottom land as they approach large streams. The hilltops vary in width from a few feet to about 200 feet. Side slopes are long and range from 12 to 30 percent.

The association makes up about 6 percent of the county. It is about 70 percent Fullerton soils, 5 percent Minvale soils, 5 percent Greendale soils, and 20 percent small tracts of Hamblen, Leadvale, and Newark soils.

The well drained Fullerton soils are on rolling hilltops and hillsides. They have a brownish, friable, cherty loamy surface layer and a reddish, firm cherty subsoil that is loamy in the upper part and clayey in the lower part.

The well drained Minvale soils are on foot slopes and benches. They have a brownish, friable silt loam surface layer and a brownish and reddish, friable subsoil that is loamy in the upper part and clayey in the lower part.

The well drained Greendale soils occur as narrow strips of bottom land along drainageways and streams. They have a friable, brownish loamy surface layer and subsoil.

The moderately well drained Leadvale soils have a fragipan. They are on foot slopes and at the heads of drainageways. The moderately well drained Hamblen soils and the somewhat poorly drained Newark soils are on narrow strips of bottom land.

About 70 percent of this association is cleared. Wooded tracts are scattered throughout, but are mostly on the steeper and more cherty slopes. Virginia pine and cutover hardwoods, mainly oak and hickory, are dominant.

Most farms average less than 200 acres in size. The main crops are hay and pasture plants, but corn, small grain, and tobacco are grown on small acreages. Cleared hillsides are used for pasture, mainly tall fescue. Corn, mainly for silage, and hay are grown on the more level foot slopes, hilltops, and along narrow strips of bottom land. Dairy farming and beef cattle are important enterprises on the larger farms. Tobacco is the main source of income on smaller farms. A small amount of timber is harvested on some farms.

Farming is limited mainly by the steep slopes and the low natural fertility. The rolling to steep hillsides that are used for pasture need large amounts of lime and fertilizer to produce good yields. Small areas suitable for cultivation are on hilltops and foot slopes and along narrow drainageways. Steep slopes also limit use of these soils for engineering. Deep cuts and fills are required in building highways. Where slopes are not too steep, most of the soils are suitable for homesites that require septic tanks.

Wooded areas provide food and cover for wildlife, and the association is well suited to development for hunting areas, parks, and other recreational facilities. Because the association has only a few perennial streams, farm ponds furnish much of the water needed by livestock. To prevent excessive seepage, compaction or chemical treatment of the soil is commonly required for pond reservoirs.

2. *Decatur-Dewey-Emory association*

Undulating to hilly soils, more than 5 feet deep over limestone, on low rounded hills and deep, nearly level and undulating soils on bottom land

This association is in limestone valleys. The soils formed in deep, noncherty residuum and old alluvium. The topography is dominantly undulating to hilly, but small areas along streams and limestone sinks and in depressions are nearly level. The shallow meandering drainageways frequently contain sinks, and a few of the streams are perennial. Slopes range from less than 2 to 20 percent.

The association makes up about 6 percent of the county. It is about 50 percent Decatur soils, 25 percent Dewey soils, 10 percent Emory soils, and 15 percent Etowah, Chagrin, Hamblen, and Newark soils.

The deep, well drained, productive Decatur and Dewey soils are on upland side slopes. They have a reddish clayey subsoil. The Decatur soils are darker in the lower part of the subsoil than the Dewey soils.

The deep, well drained, productive Emory soils are in depressions and narrow strips along drainageways. They have a dark brownish and reddish, friable silt loam surface layer and subsoil.

The well drained Etowah soils are on foot slopes and benches. The well drained Chagrin soils, the moderately well drained Hamblen soils, and the somewhat poorly drained Newark soils are in narrow strips along drainageways and streams.

About 90 percent of this association is cleared. Wooded tracts are small and generally occupy the steeper slopes. Cutover hardwoods are dominant. Loblolly pine and Virginia pine are growing in some tracts. Tree growth is good on these soils.

Farms generally average about 200 acres in size. Some of the most productive farms in the county are in this association. Most of the acreage is in hay and pasture. Corn for silage, small grain, soybeans, truck crops, and tobacco are also grown. Dairy and beef cattle are the main livestock. Hogs are grown both for home consumption and market. The steeper upland soils are mainly used for hay and pasture, and the more level soils are used for cultivated crops. If minimum tillage cropping systems are used, row crops can be grown on some of the steeper slopes. These soils are suited to all the commonly grown grasses and legumes, such as orchardgrass, alfalfa, red clover, timothy, white clover, and tall fescue. Tobacco is the main cash crop.

Because most slopes are less than 20 percent, there are few engineering problems. Most of the soils, except those subject to flooding, are suited to homesites that require septic tank field line systems.

Where perennial streams do not exist, water for livestock is a problem. Underground caverns are scattered throughout the area, and farm ponds are difficult to seal to prevent excessive seepage. Careful selection of pond reservoir sites is important.

3. *Litz-Sequoia association*

Undulating to steep soils that have a loamy or clayey subsoil and are 2 to 3½ feet deep over acid shale; on low rounded hills

This association is underlain by acid shale that extends in a narrow belt in a southwest-northeast direction across the county. It is bounded on each side by dolomitic limestone that crops out in a few places. Low, rounded hills that have gently rolling tops and short, moderately steep side slopes are characteristic of this valley. Drainageways meander through the valley, and narrow strips of nearly level bottom land are along these streams. Slopes are mainly 2 to 20 percent.

The association makes up about 5 percent of the county. It is about 45 percent Litz soils, 40 percent Sequoia soils, and 15 percent small areas of Farragut, Leadvale, Beason, Chagrin, Hamblen, and Newark soils.

The well drained Litz soils are mainly on side slopes. They have a brownish, friable loamy surface layer and a brownish shaly loamy subsoil. Shale fragments are in the subsoil, and soft shale rock is at a depth of 20 to 40 inches.

The well drained Sequoia soils are mostly on broad, gently rolling ridgetops. They have a brownish, friable loamy surface layer and a reddish clayey subsoil. Soft shale bedrock is at a depth of 20 to 40 inches.

The well drained Farragut soils are mainly on gently rolling hilltops. The moderately well drained Leadvale soils are on foot slopes and at the heads of drainageways. Small tracts of well drained Chagrin soils, moderately well drained Hamblen soils, and somewhat poorly drained Newark soils are in narrow strips along streams. The moderately well drained to somewhat poorly drained clayey Beason soils are on low terraces and foot slopes.

About 70 percent of this association is cleared. A sizable acreage on the steeper slopes is severely eroded and is reverting to Virginia pine or is being set to loblolly pine. Uncleared areas are in mixed hardwood and pine. A few tracts are idle or in unimproved pasture. Timber growth is generally slow, except on foot slopes and on narrow bottom land.

Farms in this association average about 150 acres in size. They are used mostly for pasture, mainly tall fescue and white clover. Small patches of hay, corn, soybeans, and tobacco are grown. Many farms are operated on a part-time basis and supplemental income is derived from off-farm employment. Some of the larger farms have sizable dairy or beef cattle herds. Tobacco is the main cash crop on most farms. Truck crops provide a major source of income on a limited number of farms.

Farming in this association is limited because many soils are moderately deep, droughty, low in natural fertility, and steep. Severe erosion in some places has lowered the fertility and available water capacity and has made tillage more difficult. More than half of this association is not suited to row crops. The areas that are suited are mainly on the more level ridgetops or on narrow strips along drainageways and streams, which sometimes require drainage to produce feasible yields. If well managed, the smoother, less eroded upland areas are moderately productive for pasture and row crops. The steeper and shallower soils are best suited to woodland, mainly loblolly pine and Virginia pine.

Most of these soils are favorable as pond and lake sites. They have moderately slow permeability and a small risk of seepage. Because water moves slowly through most of the soils and thickness to underlying rock is less than 3½ feet, the limitation is severe for septic tank filter fields. Other engineering practices are mainly limited by slope.

4. *Talbott-Gladeville association*

Rolling to steep soils that have a firm, plastic clayey subsoil and are less than 3½ feet deep over limestone; on low rounded hills

This association forms a narrow belt of low-lying hills that crosses the county in a southwest-northeast direction. It is dominantly rolling to hilly, but ranges to steep. It is underlain by clayey limestone that crops out in places (fig. 1). Slopes are about 5 to 25 percent.

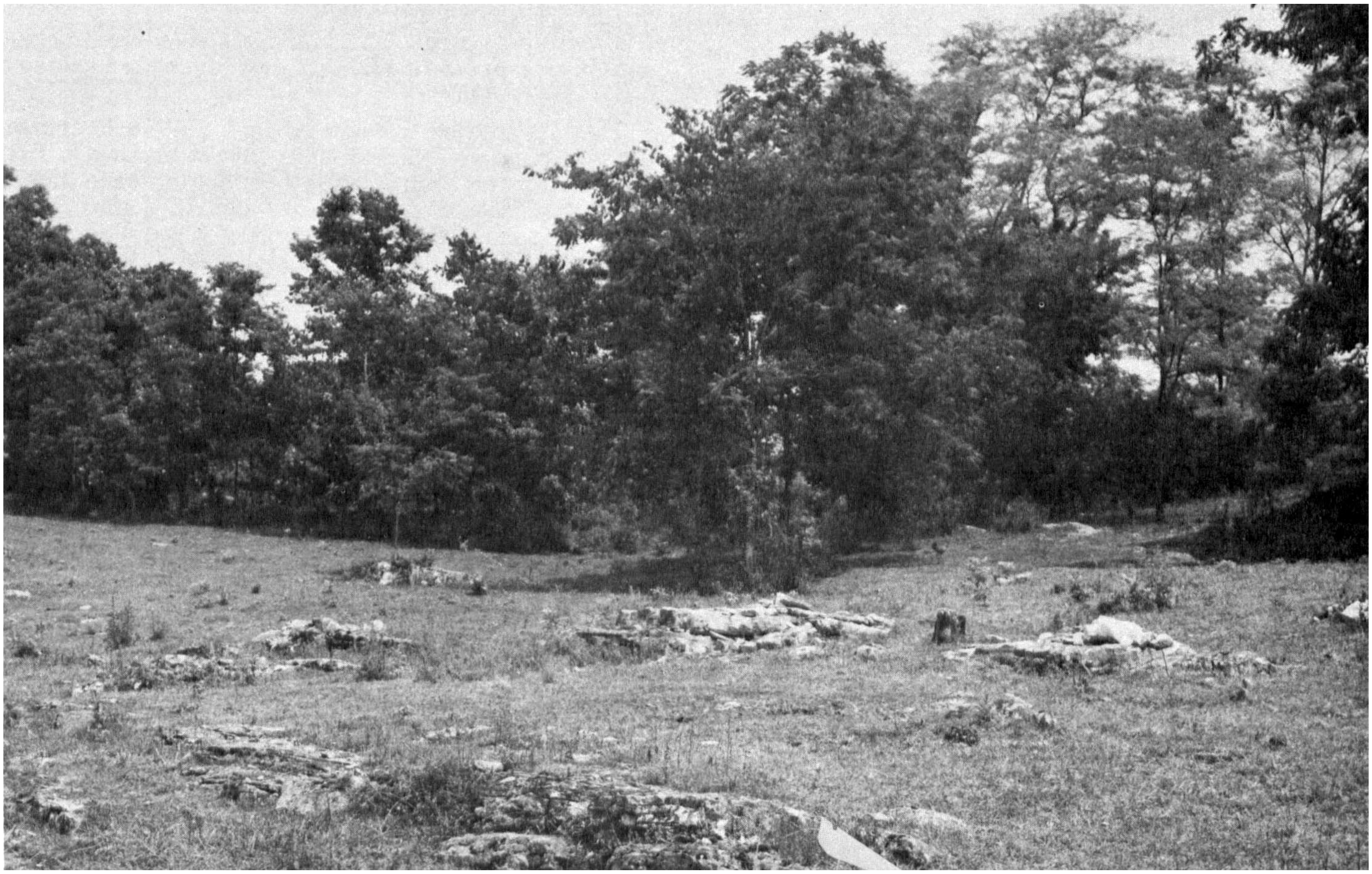


Figure 1.—Typical landscape on Talbott-Gladeville association. Numerous rock outcrops in an area of unimproved pasture on Talbott soil.

The association makes up about 1 percent of the county. It is about 70 percent Talbott soils, 10 percent Gladeville soils, and 20 percent small tracts of Hamblen, Emory, and Etowah soils.

The moderately deep, well drained Talbott soils are on sloping to steep, low, rounded hills. They have a brownish, friable loamy surface layer and a firm, plastic clayey subsoil that is reddish in the upper part and brownish in the lower part. Limestone bedrock is at a depth of 20 to 40 inches.

The very shallow Gladeville soils, which are in the less sloping areas, occur as small patches among ledges of rock. They have a dark brownish, flaggy loamy surface layer and a dark brownish, flaggy clayey subsoil. Depth to bedrock ranges from 3 to 12 inches.

The minor soils in the association are the well drained Etowah and Emory soils on foot slopes and in potholes and the moderately well drained Hamblen soils in depressions and in narrow strips along drainageways and streams.

Less than half of this association is cleared. Much of the cleared acreage is used for pasture, mostly unimproved pasture. Corn, small grain, and hay are grown in small patches on foot slopes and along drainageways. Farms are small, averaging about 65 acres in size. Tobacco is the main cash crop. Most farming is on a part-time basis. Supplemental income is derived from off-farm employment.

Much of this association is moderately steep, rocky, or shallow over bedrock and is poorly suited to row crops. The moderately low available water capacity limits the yield of hay and pasture. A small acreage of deeper soils, mainly on foot slopes, along drainageways, and in depressions produces a fair yield of tall fescue and lespedeza. Most of the rocky areas are in forests of redcedar and some Virginia pine, hickory, and oak. Some areas that have been cleared are idle.

These soils have severe limitations for homesites that require septic tank filter fields because water moves slowly through the soils, except where sinkholes and underlying caverns occur. Highway construction is limited by the moderate depth and shallowness over bedrock because cutting and filling require blasting of rock. Crevices and underground caverns and the resulting seepage limit the building of ponds.

5. *Tellico-Alcoa-Neubert association*

Hilly to very steep soils, 3½ to 5 feet deep over reddish sandy limestone, on high hills and ridges and deep, nearly level to hilly soils on bottom land and foot slopes

This association consists of moderately steep to very steep hillsides and narrow ridgetops that are underlain by ferruginous sandy limestone and shale. Locally this area is known as the "red knobs" (fig. 2). A small part of the association is undulating to hilly foot slopes and

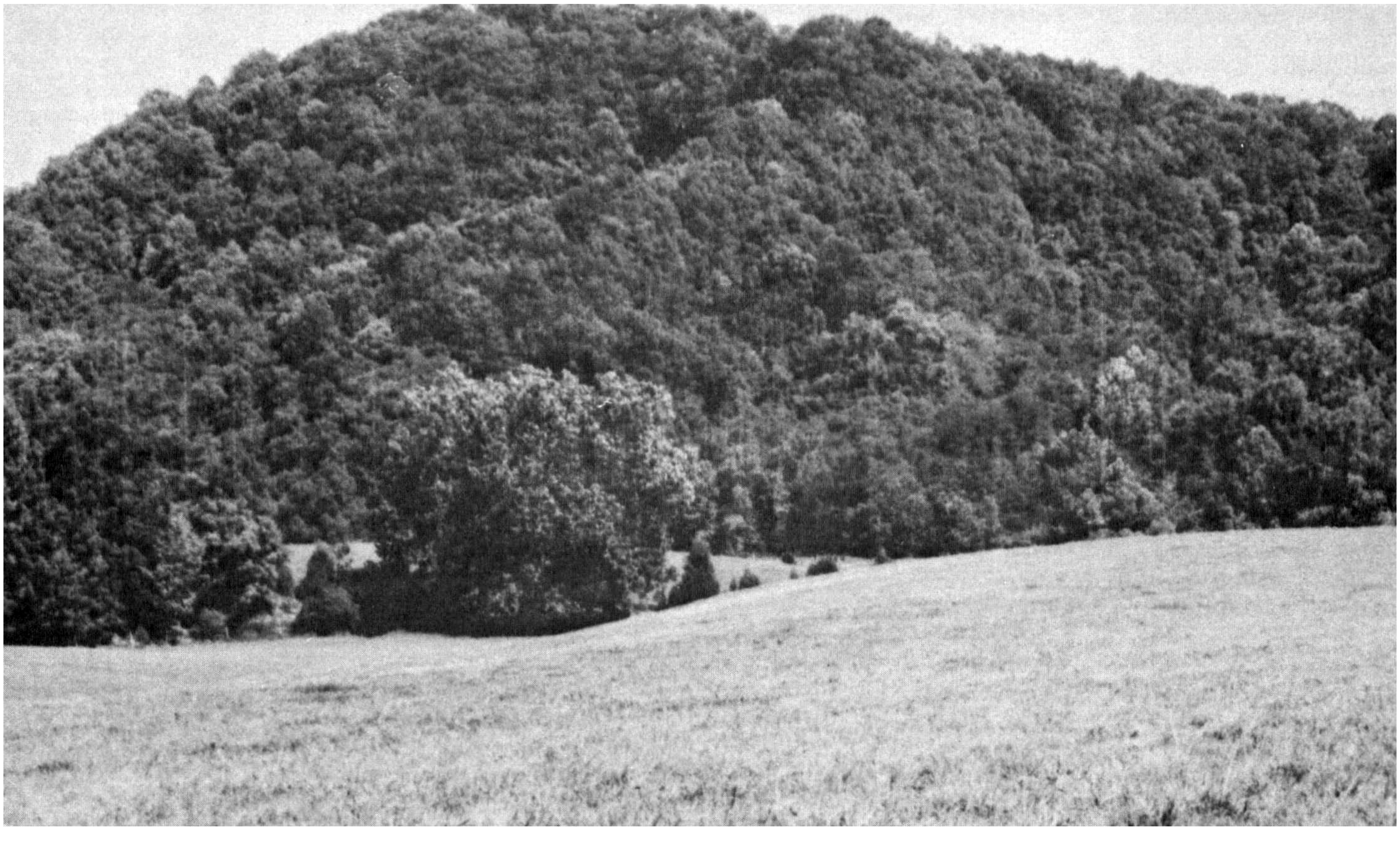


Figure 2.—Typical landscape on Tellico-Alcoa-Neubert association. Alcoa soils are in the foreground. Tellico soils are on the steep wooded slopes.

nearly level strips along streams and narrow drainageways. Slopes range from less than 2 to more than 60 percent, but are mostly 12 to 40 percent.

The association makes up about 12 percent of the county. It is approximately 60 percent Tellico soils, 15 percent Alcoa soils, 5 percent Neubert soils, and 20 percent small tracts of Steekee, Bland, Christian, Montevallo, Hamblen, and Newark soils.

The deep, well drained Tellico soils are on hillsides and ridgetops. They are reddish, friable, and loamy throughout.

The deep, well drained Alcoa soils are on colluvial foot slopes and benches at the bottom of steep uplands. They have a brownish, friable loamy surface layer and a reddish, friable subsoil that is loamy in the upper part and clayey in the lower part.

The deep, well drained Neubert soils are in nearly level narrow strips along drainageways. They are dark brownish, friable, and loamy throughout.

Bland, Christian, and Montevallo soils are the dominant minor soils in this association. The moderately deep, well drained Bland soils are on rolling ridgetops and steep side slopes that are underlain by mudstone. They are reddish and have a firm, clayey subsoil. The Christian soils are on the lower lying hills and ridges below Tellico soils. They formed in the shaly part of the formation. The shallow Montevallo soils, which formed in greenish acid shale, are on moderately steep ridgetops and steep side slopes.

The well drained Steekee soils, which are also minor in the association, are on narrow hilltops and steep upper side slopes above Tellico soils. The moderately well drained Hamblen soils and the somewhat poorly drained Newark soils are on narrow strips of bottom land and along drainageways and small streams that meander through the association.

Less than half of this association is now cleared. Most of the steeper areas, once cleared, are now idle, are in unimproved pasture, or have reverted by natural seeding to Virginia pine. Many of the steeper cultivated tracts are severely eroded. Uncleared areas are in cutover hardwood and pine.

Most farms range from 40 to 100 acres in size, but a few are as much as 400 acres. Most small farms are on a part-time basis. The low income must be supplemented by off-farm employment.

Most of the steep slopes are woodland, mainly oak, hickory, locust, Virginia pine, and yellow-poplar. Crops are grown mainly on broad ridgetops, gently rolling foot slopes, and along narrow strips of bottom land. Most of the pasture is native grasses, but some improved pasture of tall fescue and white clover is grown. Tobacco is the main cash crop, and vegetables are grown mostly for home consumption. Some of the larger farms have dairy and beef cattle herds.

Farming is limited on more than half of this association by steepness of slope, hazard of erosion, and low fertility. Much of it is too steep to establish and maintain acceptable pasture or hay stands. The rolling to steep hillsides are difficult to fertilize and lime.

This association is best suited to trees. Black locust, yellow-poplar, black walnut, and maple make good growth on the lower and middle slopes. Virginia pine, loblolly pine, shortleaf pine, red oak, post oak, and black oak grow best on the upper slopes. Locust posts and pulpwood are the main wood products.

Numerous wooded areas and streams provide food, water, and cover for wildlife. The association is well suited to development for hunting areas, parks, and other recreational facilities. Steep slopes and susceptibility to landslides create engineering problems in highway construction. Where slopes are not too steep, most of the soils are suited to septic tank absorption fields.

6. *Dunmore-Dewey association*

Dominantly rolling and hilly soils, more than 5 feet deep over limestone, on low rounded hills

This association consists of soils that are more than 5 feet deep over limestone bedrock and are on low rounded hills. The topography is dominantly rolling to hilly, but ranges from undulating to steep. Limestone sinks, depressions, and irregular topography are characteristic of this association.

The association makes up about 8 percent of the county. It is about 45 percent Dunmore soils, 25 percent Dewey soils, and 30 percent Decatur, Emory, Chagrin, Etowah, Waynesboro, Hamblen, Newark, Beason, and Purdy soils.

The deep, well drained Dunmore soils are in upland positions. They formed in clayey residuum from dolomitic limestone, mainly on gently rolling tops of low rounded ridges and hilly side slopes. They have a brownish, friable loamy surface layer and a reddish, firm clayey subsoil.

The deep, well drained, productive, undulating to hilly Dewey soils are in broad valleys. They formed in old alluvium 1 foot to 2 feet deep and the underlying residuum derived from dolomitic limestone. They have a brownish, friable loamy surface layer. The subsoil is brownish, friable, and loamy in the upper part and reddish, firm, and clayey in the lower part.

The minor soils in the association are the well drained Decatur soils on uplands, the well drained Etowah soils on foot slopes, and the well drained Emory soils along narrow drainageways and in depressions. Small tracts of the well drained Chagrin soils, moderately well drained Hamblen soils, and somewhat poorly drained Newark soils are on bottom land along streams and drainageways. Small areas of the poorly drained Purdy soils are in depressions and old stream channels. A few tracts of the well drained Waynesboro soils are on old terrace positions high above the flood plain.

About 75 percent of this association is cleared. Wooded tracts are scattered throughout the area, but are mostly on steeper slopes. Uncleared tracts are dominantly hardwoods intermingled with a few pines. Most farms are about 150 acres in size. Many kinds of crops and pasture plants grown in the county are suited. Corn and small grain are grown mainly for silage. Tobacco has become an important cash crop, and recently many acres have been planted to soybeans.

Dairy and beef cattle are important. General livestock farms are numerous.

These soils are moderately fertile. Farming is limited mainly by steep slopes and the hazard of erosion. The rolling hillsides are suited to all commonly grown pasture and hay crops, such as orchardgrass, tall fescue, timothy, red clover, white clover, and alfalfa. The gently sloping ridgetops, foot slopes, and nearly level bottom land are well suited to most row crops. Improved drainage, where needed on bottom land, increases suitability for crops and improves yields. The soils respond well to improved management, especially to applications of lime and fertilizer.

Farm ponds furnish much of the water needed by livestock. Good site selection and proper construction are necessary to insure a dependable pond reservoir. Chemical treatment is commonly required to prevent seepage.

7. *Dandridge association*

Hilly to very steep soils, dominantly 1 to 2 feet deep over calcareous shale, on high winding ridges

This association consists of highly dissected hillsides and narrow, winding ridgetops. The soils formed in calcareous shale that is commonly called "black slate." The drainageways that meander through the association are in an intricate pattern. They are narrow and deep at the head, but become broader as they approach larger streams. Slopes are 5 to 20 percent on ridgecaps. Side slopes range mostly from 20 to 50 percent. In a few areas they are steeper.

The association makes up about 3 percent of the county. It is about 85 percent Dandridge soils and 15 percent is mostly Christian, Hamblen, Leadvale, and Newark soils.

The excessively drained, shallow Dandridge soils are on hilltops and hillsides. They have a brownish, shaly loamy surface layer and a brownish, shaly clayey subsoil.

Minor soils in the association are the well drained Christian soils on broad ridgetops, the moderately well drained Leadvale soils on foot slopes and at the heads of drainageways, and the moderately well drained Hamblen soils and somewhat poorly drained Newark soils on flood plains.

About 60 percent of this association is cleared. Uncleared tracts are mostly in cutover hardwood intermingled with Virginia pine. Many acres, once cleared, are idle or are reverting to Virginia pine or redcedar. Some have been set to loblolly pine. Red oak, white oak, black locust, and hickory are the dominant hardwoods. Idle areas are in blackberry vines, sawbriers, persimmon, and sassafras bushes.

Most farms average less than 100 acres in size. The main cultivated areas are the rolling ridgecaps. Most of the cleared acreage is used for pasture and hay, mainly tall fescue, white clover, and lespedeza. Tobacco is the main cash crop, and vegetables are grown mostly for home consumption. Small herds of dairy and beef cattle are on some of the larger farms. Most farming is on a part-time basis. A small amount of timber is harvested annually, mainly for pulpwood or fence posts.

This association is not suited to row crops, but the more level areas are fairly well suited to pasture and hay. Steep slopes, very low available water capacity, moderately low fertility, slow permeability, and poor tilth limit the use of this association. Pasture and hay crops make good growth during moist periods, but little growth during summer and early fall. The best suited pasture plants are bluegrass, tall fescue, white clover, and lespedeza. Pasture and hay plants respond to applications of fertilizer, but not to liming because the soils are mostly neutral. The association is best suited to forest, mainly Virginia pine, loblolly pine, and redcedar.

This association contains many spring-fed streams. Because of the moderately slow permeability, the soils are suited to construction of ponds and lakes. Roads are not easily built and maintained because the soils are steep and cutting and filling are needed. Limitations are severe for homesites that require septic tanks.

8. *Statler-Staser-Transylvania association*

Nearly level and undulating soils, more than 5 feet deep over bedrock, on low terraces and bottom land

This association occurs as three small areas of long, narrow strips of low terraces and first bottoms along the Conasauga, Tellico, and Little Tennessee Rivers. The soils are some of the most fertile in the county. Slopes are dominantly less than 2 percent.

The association makes up about 2 percent of the county. It is about 25 percent Statler soils, 15 percent Staser soils, 15 percent Transylvania soils, and 45 percent mostly Chagrin, Lobdell, Newark, Hamblen, Whitwell, and Sequatchie soils.

The deep, well drained Statler soils are on low terraces. They formed in alluvium from mountain sediment. They have a brownish, friable loamy surface layer and subsoil.

The deep, well drained Staser soils are on bottom land along the Tellico River and its tributaries. They have a brownish, friable loamy surface layer and subsoil. They receive sediment mostly from the mountains.

The deep, well drained Transylvania soils are on narrow strips of bottom land. These soils formed in mountain sediment, mainly along the Little Tennessee River. They are brownish, friable, and loamy throughout, but they are much darker in the upper 2 to 3 feet.

The well drained Chagrin soils formed in loamy sediment on bottom land. The well drained Sequatchie soils and the moderately well drained Whitwell soils formed in loamy sediment on low terrace benches. The moderately well drained Lobdell soils formed mostly in phyllite and siltstone sediment in pockets along streams originating in the mountains. The moderately well drained Hamblen soils and the somewhat poorly drained Newark soils formed mainly in limestone and shale sediment along streams that originate in the valley.

Practically all of this association is cleared. Farms average more than 200 acres in size, and some are as much as 500 acres or more. A large acreage along the Little Tennessee River and lower Tellico River above the Tellico Dam will be flooded when the Tennessee Valley Authority completes the dam. A large part of this association is used for crops, mainly corn, small grain, soybeans, truck crops, and tobacco. Double cropping is a common practice. The rest is used for hay and pasture, mainly tall fescue, orchardgrass, white clover, and lespedeza. Several acres purchased by the Tennessee Valley Authority for the Tellico Dam Project are now idle. Few farms are entirely within this association.

Some of the most productive soils in the county are in this association. They are nearly level and fertile and are suited to intensive farming and a wide variety of crops and pasture plants. The main limitations are wetness in low areas and flooding for brief periods.

9. *Calvin association*

Rolling to steep soils, 2 to 3½ feet deep over reddish shale, on high hills and knobs

This association consists of hilly and steep soils that formed in material weathered from reddish shale on uplands. Valleys are V-shaped, and drainageways are narrow at the head but are wider as they approach larger streams. Slopes range from 5 to 20 percent on the wider ridgetops and from 20 to 40 percent on steep side slopes.

The association makes up slightly less than 1 percent of the county. It is about 60 percent Calvin soils and 40 percent mostly Litz, Sequoia, Etowah, Farragut, Chagrin, and Hamblen soils.

The Calvin soils are on narrow, irregular ridgetops and side slopes. They have a brownish, friable loamy surface layer and subsoil. Content of shale fragments ranges from about 10 percent in the surface layer to as much as 80 percent in the lower part of the subsoil. Depth to bedrock ranges from 20 to 35 inches.

The Litz and Sequoia soils are on the wider, gently rolling ridgecaps. They formed in the yellow shale member of the formation. The deep, well drained Etowah and Farragut soils formed on old terraces. The well drained Chagrin soils and moderately well drained Hamblen soils are in narrow strips of bottom land along streams.

At least 65 percent of this association is in mixed hardwood and pine. The steeper areas, once cleared, are now idle or are reverting to forest, mainly Virginia pine. The more level upland areas are in hay and pasture, mostly tall fescue and lespedeza. Narrow strips along drainageways and streams are used for vegetables and tobacco. Farms average about 100 acres in size and are mostly operated on a part-time basis. The main cash crop is tobacco. Some income is derived from the sale of pulpwood and posts.

Because of steep slopes and the shallowness of the soils, most of this association has low potential for farm and nonfarm use.

10. *Wallen-Jefferson-Ramsey association*

Dominantly steep and very steep soils, 1 to more than 6 feet deep over hard sandstone, on high mountainsides

This association is mainly in the southern part of the county. Intermittent small areas extend northeast into other associations. The association is a steep, rugged mountainous area (fig. 3) underlain by sandstone, quartz, and shale. Ridgecaps are narrow and side slopes are steep and long. Slopes range from 2 to 70 percent, but are mostly 20 to 50 percent.

The association makes up about 9 percent of the county. It is approximately 25 percent Wallen soils, 20 percent Jefferson soils, 5 percent Ramsey soils, and 50 percent Hartsells, Linker, Litz, Sequatchie, Pope, Philo, and Atkins soils.

The excessively drained, moderately deep Wallen soils are on the upper part of steep sandstone mountainsides. They have a brownish loamy surface layer and a gravelly subsoil.

The deep, well drained Jefferson soils are on the lower part of sloping to steep mountainsides and on foot slopes. They formed in sandstone colluvium. They have a brownish loamy surface layer and subsoil.

The shallow, somewhat excessively drained Ramsey soils are on narrow ridgecaps and the upper part of steep mountainsides. They have a brownish loamy surface layer and subsoil. Depth to bedrock ranges from 8 to 20 inches.

The moderately deep, well drained Hartsells and Linker soils are on broad ridgetops. The moderately deep Litz soils, which formed in acid shale, are on outcropping side slopes below sandstone ridges. The deep, well drained Sequatchie soils are in small tracts on foot slopes and benches on second bottoms. The well drained Pope soils, moderately well drained Philo soils, and poorly drained Atkins soils are in narrow strips along small streams or drainageways.

About 95 percent of this association is forested. Only part of the moderately steep foot slopes, gently sloping benches, and small, nearly level tracts along drainageways and streams is cleared. Many areas, once cleared, have reverted to woodland, mostly to Virginia pine, but also to oak, sourwood, hickory, dogwood, and yellow-poplar.

Most of this association is owned and controlled by the Forest Service. Small privately owned farms are located along the edges. The association is poorly suited to farming, and most farms are operated on a part-time basis. Small patches of tobacco furnish the larger part of the farm income. Garden vegetables and a few cows, hogs, and chickens are grown for home use. Some timber products are sold, mainly for pulpwood. Because of steep slopes, low fertility, and droughtiness, these soils have a higher potential for forest than for farming.

The large wooded areas provide food and cover for wildlife. The association is well suited to development for hunting areas, parks, and other recreational facilities.

11. *Ranger-Citico-Fletcher association*

Steep and very steep soils, 2 to 6 feet deep over phyllite rock, on highly dissected mountains

This association is an area of narrow, irregular ridgecaps, steep mountainsides, and V-shaped hollows and gorges. The soils formed in material weathered from phyllite or siltstone. The elevation is about 1,200 to 2,500 feet. Slopes dominantly range from 20 to 60 percent.

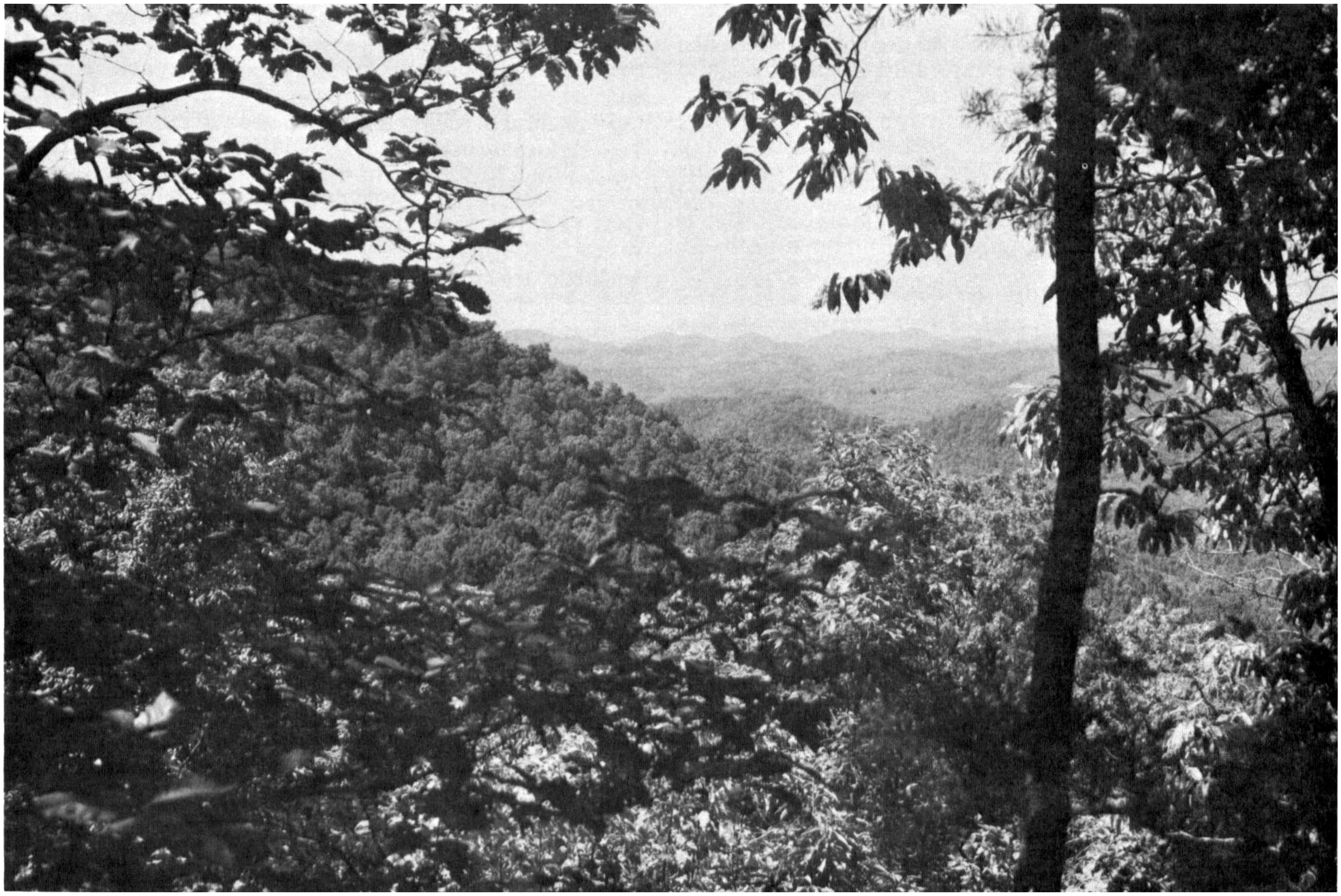


Figure 3.—Typical landscape on Wallen-Jefferson-Ramsey association.

The association makes up about 23 percent of the county. It is about 65 percent Ranger soils, 10 percent Citico soils, 5 percent Fletcher soils, and 20 percent mostly Wallen, Shelocta, Jefferson, Altavista, Pope, Philo, and Atkins soils.

The well drained, moderately deep, acid Ranger soils are on narrow, irregular ridgecaps and steep upper side slopes. They have a brownish loamy surface layer and subsoil. The content of coarse fragments ranges from about 20 percent in the surface layer to about 60 percent in the lower part of the subsoil.

The deep, well drained Citico soils are on the lower part of long, steep to very steep side slopes, on benches, and in coves. They formed in material that moved downslope over a long period. They have a brownish loamy surface layer and subsoil.

The well drained, moderately deep Fletcher soils are in small tracts on broad ridgetops and mild side slopes. They have a brownish loamy surface layer and a brownish and reddish loamy subsoil.

The Wallen and Jefferson soils are on isolated sandstone ridges capping or protruding above other soils. The deep, well drained Shelocta soils are on foot slopes and benches. They formed in sediment washed from steeper slopes. The moderately well drained Altavista soils are on foot slopes and low terraces. The well drained Pope soils, the moderately well drained Philo soils, and the poorly drained Atkins soils are in small, narrow tracts along streams and drainageways.

About 95 percent of this association is forest, mainly Virginia pine, shortleaf pine, sourwood, red maple, oak, hickory, and dogwood. About 80 percent of the association is in the Cherokee National Forest. Most privately owned farms average less than 50 acres in size and are operated on a part-time basis. Most of the cleared areas are used for vegetables and hay and pasture for a small number of livestock. Tall fescue, white clover, and lespedeza are the main forage crops. Some truck crops, such as bell pepper, are grown by consignment for marketing, and some wood products are sold each year.

Steep slope limits the potential of most of this association for farm and nonfarm uses. The soils are moderately low in fertility and available moisture. The association is best suited to trees. Pine, hickory, oak, and maple grow well on the upper and middle slopes, and the better hardwoods, including yellow-poplar, are suited to the lower concave slopes and the coves.

Permanent streams provide food, water, and cover for wildlife. Most streams are frequently stocked with trout. Managed hunts for bear, wild hogs, deer, and other small game are conducted each year. The association is well suited to development for hunting, fishing, parks, and other recreational facilities. Many camp sites have been established. Panning for gold is popular in the Coker Creek area.

Roads are difficult to construct in this area because the soils are steep and deep cuts and fills are needed.

12. Sylco-Citico-Brookshire association

Steep and very steep soils, 2 to 8 feet deep over phyllite and arkosic sandstone rock, on high mountainsides and in deep coves

This association consists of well drained and excessively drained soils on steep and very steep mountainsides. Elevation is about 2,000 to 4,000 feet. The soils are on narrow, irregular ridgecaps and steep side slopes as much as 500 feet long. They formed in slate, phyllite, and arkosic or graywacke sandstone. Slopes range from 10 to 75 percent, but are mostly 30 to 75 percent.

The association makes up about 11 percent of the county. It is about 65 percent Sylco soils, 10 percent Citico soils, 5 percent Brookshire soils, and 20 percent mostly Jeffrey, Ditney, Unicoi, Spivey, and Shouns soils.

The well drained Sylco soils are 20 to 40 inches thick over slate or phyllite bedrock. They are on narrow ridgecaps and steep upper side slopes. They have a brownish loamy surface layer and subsoil. The content of coarse fragments ranges from about 20 percent in the surface layer to about 60 percent in the lower part of the subsoil.

The deep, well drained Citico soils are on the lower half of steep side slopes and in coves. They formed in sediment from higher lying soils that are underlain by phyllite and slate. They have a brownish loamy surface layer and subsoil. The content of coarse fragments ranges from about 15 percent in the surface layer to about 40 percent in the lower part of the subsoil.

The deep, well drained Brookshire soils are on the lower parts of steep mountainsides and in coves. They formed in soil material moved downslope from other soils that formed in place over arkosic sandstone, graywacke sandstone, phyllite, conglomerate, and quartzite. They have a brownish loamy surface layer and subsoil.

The steep, well drained Jeffrey and Spivey soils are in coves and concave positions. The well drained Shouns soils are on benches and foot slopes. The moderately deep Ditney soils and the shallow Unicoi soils are on ridgecrests and the upper part of mountainsides.

This association is within the Cherokee National Forest, and practically all is forested. A few broad ridgetops and coves are in native grasses, and a few areas have been seeded to pasture for experimental purposes. Chestnut oak, scarlet oak, Virginia pine, pitch pine, and red maple are on the upland slopes. The coves and lower slopes support yellow-poplar, northern red oak, white oak, basswood, hickory, white pine, hemlock, and silverbell.

Steep slopes limit the soils for farm or nonfarm uses. Because of the difference in slope, depth, and elevation, these soils are suited to a wide variety of tree species.

Perennial streams and good vegetation furnish food, water, and protection for wildlife. The association is well suited to fishing and hunting. It has moderate to severe limitations for camping and other recreational facilities. Wildlife hunts are managed by the Tennessee Wildlife Resources Agency.

Cattle are brought to this area each spring by those who still have grazing permits.

13. Ditney-Brookshire-Jeffrey association

Dominantly steep and very steep soils, 2 to 8 feet deep over arkosic sandstone, on high mountainsides and in deep coves

This association is on narrow ridgetops and long, steep mountainsides and in deep coves. Elevation is 3,000 to 5,000 feet. The soils formed in material underlain by slate, phyllite, graywacke, arkosic sandstone, and probably granite and conglomerate in some places. Slopes range from 10 to 70 percent, but are mostly 40 to 60 percent.

The association makes up about 13 percent of the county. It is about 40 percent Ditney soils, 25 percent Brookshire soils, 15 percent Jeffrey soils, and 20 percent mostly Spivey and Unicoi soils.

The moderately deep, well drained, acid Ditney soils are on high mountaintops and steep mountainsides. They have a brownish loamy surface layer and subsoil that are cobbly throughout. Slopes range from 12 to 60 percent, but are dominantly 30 to 60 percent.

The deep, well drained, acid Brookshire soils are on lower parts of mountainsides and in deep coves. They have a brownish loamy surface layer and subsoil. Slopes range from 10 to 60 percent, but are commonly between 20 to 40 percent.

The deep, well drained Spivey soils are dark and cobbly. They are in coves and on the lower parts of steep mountainsides. The shallow, excessively drained Unicoi soils also are cobbly. They are on steep to very steep points, convex side slopes, and narrow ridgecaps.

This association is within the Cherokee National Forest, and practically all is in forest managed and controlled by the Forest Service. Northern red oak, white oak, chestnut oak, hemlock, yellow-poplar, basswood, silverbell, white pine, Virginia pine, red spruce, Fraser fir, and pitch pine are dominant. Tree growth is limited mostly by the high elevation.

This association is best suited to camping, recreation, hunting, and fishing. Trout fishing, as well as bear, boar, deer, and small game hunts, are managed by the Tennessee Wildlife Resources Agency. Perennial streams and good vegetation furnish food, water, and protection for wildlife.

Steep slopes limit the soils for farm and nonfarm uses. Cattle are still grazed in summer by those having permits issued when this association was designated as a national forest.

Descriptions of the Soils

This section describes the soil series and mapping units in Monroe County. Each soil series is described in detail, and then, briefly, each mapping unit in that series. Unless it is specifically mentioned otherwise, it is to be assumed that what is stated about the soil series holds true for the mapping units in that series. Thus, to get full information about any one mapping unit, it is necessary to read both the description of the mapping unit and the description of the soil series to which it belongs.

An important part of the description of each soil series is the soil profile, that is, the sequence of layers from the surface downward to rock or other underlying material. Each soil series description contains a short narrative description of a profile considered representative of the series, and a much more detailed description of the same profile that scientists, engineers, and others can use in making highly technical interpretations. The colors described are for moist soil, unless otherwise noted. The profile described in the soil series is representative for mapping units in that series. If the profile of a given mapping unit is different from the one described for the series, these differences are stated in the description of the mapping unit. The description of each mapping unit contains suggestions on how the soil can be managed.

Preceding the name of each mapping unit is a symbol. The symbol identifies the mapping unit on the detailed soil map. Listed at the end of each description of a mapping unit are the capability unit and the woodland suitability group to which the mapping unit has been assigned.

Some of the terms used in the soil descriptions are defined in the Glossary, and some are defined in the section "How This Survey Was Made." The approximate acreage and proportionate extent of each soil mapped are show in table 4. The "Index to Mapping Units" on page ii lists the mapping units in the county and the page where each unit is described.

Alcoa Series

The Alcoa series consists of deep, well drained, and gently sloping to moderately steep soils. These soils are on benches and foot slopes in the region known as the "red knobs." They formed in material that washed or moved downslope from the reddish Tellico soils. Slopes are 2 to 20 percent.

In a representative profile the surface layer is dark reddish brown, friable loam about 7 inches thick. The subsoil is dark red, friable clay loam and clay to a depth of 62 inches. Between 62 and 74 inches it is dark red sandy clay.

Except in severely eroded areas, Alcoa soils are easy to work. They are strongly acid or very strongly acid throughout the profile. Where limed, the surface layer is less acid. Permeability is moderate and the available water capacity is high.

These soils are used for corn, tobacco, hay, and pasture. Only a few of the smaller or steeper areas are in farm woodlots.

Representative profile of Alcoa loam, 2 to 5 percent slopes:

Ap—0 to 7 inches; dark reddish brown (2.5YR 3/4) loam; moderate medium granular structure; friable; many roots; medium acid; clear smooth boundary.

B1—7 to 13 inches; dark red (2.5YR 3/6) clay loam; moderate medium subangular blocky structure; friable; common roots; thin patchy clay films on faces of peds; strongly acid; gradual smooth boundary.

B21t—13 to 20 inches; dark red (2.5YR 3/6) clay loam; moderate medium subangular blocky structure; friable; few fine roots; thin patchy clay films on faces of peds; strongly acid; gradual smooth boundary.

B22t—20 to 30 inches; dark red (2.5YR 3/6) clay; moderate medium subangular blocky structure; friable; few fine roots; few thin discontinuous and continuous clay films on faces of peds; strongly acid; gradual smooth boundary.

B23t—30 to 62 inches; dark red (2.5YR 3/6) clay; moderate medium subangular blocky structure; friable; few fine roots; few thin discontinuous and continuous clay films on faces of peds; few fine dark brown concretions; strongly acid; gradual smooth boundary.

B24t—62 to 74 inches; dark red (2.5YR 3/6) sandy clay; weak medium subangular blocky structure; friable; few thin discontinuous clay films on faces of peds; strongly acid.

The A horizon is dark brown or dark reddish brown loam or silt loam 5 to 10 inches thick. In severely eroded areas it is dark reddish brown or dark red clay loam. The B horizon is dark reddish brown or dark red clay loam, sandy clay, or clay. Alluvium is 4 to 15 feet thick. The underlying material is residuum derived from sandstone or shale, or both. Depth to bedrock is more than 5 feet.

AaB—Alcoa loam, 2 to 5 percent slopes. This deep, well drained soil is in tracts of 2 to 5 acres, mostly on foot slopes and benches below steep, upland side slopes. It has the profile described as representative of the series. Included in mapping were small areas where slopes are slightly more than 5 percent.

This soil is well suited to all crops commonly grown in the county, such as corn, soybeans, burley tobacco, small grain, and vegetables. The hazard of erosion is the main limitation in cultivated areas. The potential is high for most urban use, such as dwellings and local roads. Capability unit IIe-1; woodland group 3o7.

AaC—Alcoa loam, 5 to 12 percent slopes. This deep, well drained soil is in tracts of 3 to 10 acres on foot slopes below steep hillsides. The surface layer is dark reddish brown or dark brown and is 5 to 7 inches thick. The subsoil to a depth of 60 inches or more is dark reddish brown and dark red. It is clay loam in the upper part and clay in the lower part. Depth to bedrock is more than 5 feet.

Included with this soil in mapping were a few small eroded tracts where the surface layer is dark red clay loam. Also included were small areas where slopes are less than 5 percent or more than 12 percent.

This soil is suited to all crops commonly grown in the county, including corn, burley tobacco, small grain, and vegetables. It is well suited to alfalfa and orchardgrass and other grasses and legumes. The hazard of erosion is the main limitation for crops. The potential is high for dwellings and septic tank absorption fields

TABLE 4.—*Approximate acreage and proportionate extent of the soils*

Soil	Area	Extent
	Acres	*Percent*
Alcoa loam, 2 to 5 percent slopes	445	0.1
Alcoa loam, 5 to 12 percent slopes	3,620	.9
Alcoa loam, 12 to 20 percent slopes	605	.1
Alcoa clay loam, 5 to 12 percent slopes, severely eroded	975	.2
Alcoa clay loam, 12 to 20 percent slopes, severely eroded	1,470	.3
Allegheny loam	830	.2
Allen loam, 5 to 12 percent slopes	750	.2
Allen loam, 12 to 25 percent slopes	665	.1
Altavista silt loam	1,170	.3
Atkins silt loam	605	.1
Beason silt loam	1,305	.3
Bland silt loam, 10 to 25 percent slopes	730	.2
Bland silt loam, 25 to 50 percent slopes	3,335	.8
Bland-Rock outcrop complex, 25 to 50 percent slopes	635	.1
Brookshire loam, 20 to 40 percent slopes	18,320	4.4
Calvin silt loam, 5 to 20 percent slopes	985	.2
Calvin silt loam, 20 to 40 percent slopes	1,110	.3
Cataska-Rock outcrop complex, 35 to 75 percent slopes	1,580	.4
Chagrin silt loam	1,270	.3
Christian loam, 3 to 12 percent slopes	2,260	.5
Christian loam, 12 to 25 percent slopes	1,230	.3
Christian clay loam, 12 to 25 percent slopes, severely eroded	1,665	.4
Citico channery silt loam, 20 to 40 percent slopes	18,040	4.4
Dandridge shaly silty clay loam, 5 to 20 percent slopes	3,875	.9
Dandridge shaly silty clay loam, 20 to 35 percent slopes	2,940	.7
Dandridge shaly silty clay loam, 35 to 60 percent slopes	4,920	1.2
Decatur silt loam, 2 to 5 percent slopes	1,770	.4
Decatur silt loam, 5 to 12 percent slopes	7,085	1.7
Decatur silt loam, 12 to 20 percent slopes, eroded	1,555	.4
Decatur silty clay loam, 5 to 12 percent slopes, severely eroded	2,550	.6
Decatur silty clay loam, 12 to 20 percent slopes, severely eroded	1,950	.5
Dewey silt loam, 2 to 5 percent slopes	1,180	.3
Dewey silt loam, 5 to 12 percent slopes	7,600	1.8
Dewey silt loam, 12 to 20 percent slopes, eroded	2,830	.7
Dewey silty clay loam, 5 to 12 percent slopes, severely eroded	2,070	.5
Dewey silty clay loam, 12 to 20 percent slopes, severely eroded	3,695	.9
Ditney loam, 12 to 25 percent slopes	1,295	.3
Ditney loam, 25 to 60 percent slopes	22,785	5.7
Dunmore silt loam, 2 to 5 percent slopes	950	.2
Dunmore silt loam, 5 to 12 percent slopes	6,410	1.4
Dunmore silt loam, 12 to 20 percent slopes, eroded	3,150	.8
Dunmore silt loam, 20 to 35 percent slopes, eroded	1,335	.3
Dunmore silty clay loam, 5 to 12 percent slopes, severely eroded	1,050	.2
Dunmore silty clay loam, 12 to 20 percent slopes, severely eroded	2, 045	.5
Dunning silty clay loam	300	(1)
Emory silt loam	2,820	.7
Etowah silt loam, 2 to 5 percent slopes	3,195	.8
Etowah silt loam, 5 to 12 percent slopes	2,390	.6
Etowah silt loam, 12 to 20 percent slopes	430	.1
Farragut silt loam, 5 to 12 percent slopes, eroded	675	.1
Farragut silty clay, 12 to 20 percent slopes, severely eroded	455	.1
Fletcher silt loam, 5 to 12 percent slopes	3,225	.8
Fletcher silt loam, 12 to 20 percent slopes	2,305	0.5
Fullerton cherty silt loam, 5 to 12 percent slopes	7,225	1.5
Fullerton cherty silt loam, 12 to 20 percent slopes	8,150	2.1
Fullerton cherty silt loam, 20 to 40 percent slopes	4,050	1.0
Gladeville-Rock outcrop complex, 5 to 25 percent slopes	405	(1)
Greendale silt loam	905	.2
Hamblen silt loam	6,105	1.3
Hartsells fine sandy loam, 5 to 15 percent slopes	1,075	.2
Holston loam, 3 to 12 percent slopes	545	.1
Jefferson fine sandy loam, 3 to 12 percent slopes	1,420	.3
Jefferson fine sandy loam, 12 to 25 percent slopes	1,510	.3
Jefferson fine sandy loam, 25 to 50 percent slopes	1,110	.2
Jefferson cobbly fine sandy loam, 12 to 25 percent slopes	2,320	.5
Jefferson cobbly fine sandy loam, 25 to 50 percent slopes	1,185	.3
Jeffrey cobbly loam, 12 to 25 percent slopes	1,695	.4
Jeffrey cobbly loam, 25 to 60 percent slopes	6,945	1.6
Leadvale silt loam, 2 to 5 percent slopes	2,825	.7
Linker loam, 5 to 12 percent slopes	630	.1
Litz shaly silt loam, 5 to 12 percent slopes	3,915	.9
Litz shaly silt loam, 12 to 20 percent slopes	1,330	.3
Litz shaly silt loam, 12 to 20 percent slopes, severely eroded	2,395	.5
Litz shaly silt loam, 20 to 35 percent slopes	3,530	.9
Litz and Sequoia soils, gullied	1,345	.3
Lobdell silt loam	885	.2
Minvale silt loam, 2 to 5 percent slopes	790	.2
Minvale silt loam, 5 to 12 percent slopes	1,260	.3
Montevallo shaly silt loam, 12 to 30 percent slopes	1,255	.3
Neubert loam	2,030	.5
Newark silt loam	1,860	.4
Philo silt loam	2,085	.5
Pope loam	1,455	.3
Purdy silt loam	525	.1
Ramsey-Rock outcrop complex, 20 to 70 percent slopes	1,665	.4
Ranger channery silt loam, 12 to 25 percent slopes	9,765	2.4
Ranger channery silt loam, 25 to 60 percent slopes	56,955	13.6
Sequatchie loam	365	(1)
Sequoia silt loam, 2 to 5 percent slopes	2,645	.6
Sequoia silt loam, 5 to 12 percent slopes, eroded	4,035	1.0
Sequoia silt loam, 12 to 20 percent slopes, eroded	1,020	.2
Sequoia silty clay, 5 to 12 percent slopes, severely eroded	2,255	.5
Sequoia silty clay, 12 to 20 percent slopes, severely eroded	1,050	.2
Shelocta silt loam, 3 to 12 percent slopes	1,595	.4
Shelocta silt loam, 12 to 25 percent slopes	1,340	.3
Shouns silt loam, 12 to 25 percent slopes	600	.1
Spivey cobbly loam, 20 to 60 percent slopes	7,485	1.7
Staser loam	1,250	.3
Statler loam	2,355	.5
Steekee loam, 20 to 50 percent slopes	3,205	.8
Sylco channery silt loam, 25 to 65 percent slopes	32,275	7.6
Talbott silt loam, 5 to 12 percent slopes, eroded	1,100	.3
Talbott silt loam, 12 to 20 percent slopes, eroded	565	.1
Talbott clay, 5 to 12 percent slopes, severely eroded	525	.1
Talbott clay, 12 to 20 percent slopes, severely eroded	560	.1
Talbott-Rock outcrop complex, 5 to 20 percent slopes	1,025	.2

TABLE 4.—*Approximate acreage and proportionate extent of the soils*—Continued

Soil	Area	Extent
	Acres	*Percent*
Talbott-Rock outcrop complex, 20 to 40 percent slopes	2,125	.5
Tellico loam, 12 to 20 percent slopes	3,510	.9
Tellico loam, 20 to 35 percent slopes	2,405	.6
Tellico loam, 35 to 60 percent slopes	15,920	3.7
Tellico clay loam, 12 to 20 percent slopes, severely eroded	4,020	1.0
Tellico clay loam, 20 to 35 percent slopes, severely eroded	4,210	1.0
Tellico and Dewey soils, gullied	1,950	.5
Transylvania loam	1,195	.3
Unicoi cobbly loam, 30 to 65 percent slopes	320	(1)
Wallen gravelly fine sandy loam, 20 to 60 percent slopes	10,350	2.7
Waynesboro loam, 2 to 5 percent slopes	410	.1
Waynesboro loam, 5 to 12 percent slopes	3,320	.8
Waynesboro loam, 12 to 20 percent slopes	1,130	.3
Waynesboro loam, 20 to 35 percent slopes	665	.1
Waynesboro clay loam, 5 to 12 percent slopes, severely eroded	670	.1
Waynesboro clay loam, 12 to 20 percent slopes, severely eroded	890	.2
Whitwell loam	480	.1
Water	1,665	.4
Total	422,400	100.0

[1] Less than 0.05 percent.

and medium for local roads. Capability unit IIIe-1; woodland group 3o7.

AaD—Alcoa loam, 12 to 20 percent slopes. This deep, well drained soil is in tracts of 3 to 10 acres on foot slopes below steep ridges in the section known as "red knobs." The surface layer is dark reddish brown or dark brown and is 5 to 7 inches thick. The upper part of the subsoil is dark reddish brown, friable clay loam to a depth of about 2 feet. Below this, it is dark reddish brown or dark red, friable clay that extends to a depth of 5 feet or more. Depth to shale or limestone bedrock is more than 5 feet.

Included with this soil in mapping were small areas where bedrock is at a depth of 4 to 5 feet. In a few places the surface layer is fine sandy loam. Also included were spots that contain a few shale fragments and a few severely eroded areas less than 2 acres in size.

This soil is suited to all crops and hay and pasture plants commonly grown in the county. The hazard of erosion is severe in cultivated areas. Because of the slope, the potential is medium for most urban use. Capability unit IVe-1; woodland group 3o7.

AcC3—Alcoa clay loam, 5 to 12 percent slopes, severely eroded. This deep, well drained soil is in tracts of 2 to 5 acres below steep hillsides. The plow layer is dark reddish brown or dark red and is made up mainly of the former subsoil. The subsoil is dark reddish brown or dark red clay loam in the upper part and dark red or dark reddish brown clay in the lower part. A few areas were included in mapping where slopes are more than 12 percent.

This soil is best suited to hay and pasture because of poor workability and the hazard of further erosion if cultivated. Tall fescue, orchardgrass, alfalfa, white clover, red clover, and sericea lespedeza are suited. Cultivated crops can be grown occasionally in a long cropping system without damage to the soil. The potential is high for most urban use, such as dwellings with septic tank absorption fields. Low strength is a limitation for local roads. Capability unit IVe-1; woodland group 3o7.

AcD3—Alcoa clay loam, 12 to 20 percent slopes, severely eroded. This deep, well drained soil is in tracts of 2 to 5 acres on foot slopes and benches. The plow layer is dark reddish brown or dark red and is made up mainly of the former subsoil. The subsoil is dark reddish brown or dark red clay loam in the upper part and dark reddish brown or dark red clay in the lower part.

Included with this soil in mapping were small areas where slopes are less than 12 percent or more than 20 percent. Some tracts contain slightly eroded areas that have a dark brown or reddish brown, friable loam surface layer. Also included were a few gullied areas.

This soil is best suited to perennial pasture or woodland because of the moderately steep slopes, the hazard of further erosion if cultivated, and poor tilth. Tall fescue, white clover, red clover, Midland bermudagrass, and sericea lespedeza are suited. The trees best suited are loblolly pine, Virginia pine, white pine, and shortleaf pine. Because of the slope, the potential is medium for most urban use. Capability unit VIe-1; woodland group 3o7.

Allegheny Series

The Allegheny series consists of deep, well drained, loamy soils. These soils are on low terraces along streams in the mountains. They formed in sediment derived from a variety of rocks, including sandstone, shale, phyllite, and slate. Elevation is 1,000 to 2,000 feet. Slopes are 0 to 3 percent.

In a representative profile the surface layer is brown loam about 8 inches thick. The subsoil is yellowish brown and strong brown, friable loam and clay loam to a depth of about 42 inches. The underlying material between depths of 42 and 58 inches is brown fine sandy loam that contains a few waterworn pebbles.

Allegheny soils are easy to work and are rarely subject to flooding. Response to management is excellent. These soils are strongly acid throughout the profile. Where limed, the surface layer is less acid. Permeability is moderate, and the available water capacity is high.

These soils are used for hay and pasture and small fields of row crops.

Representative profile of Allegheny loam:

Ap—0 to 8 inches: brown (10YR 4/3) loam; moderate medium granular structure; friable; many roots; medium acid; clear smooth boundary.

B1—8 to 12 inches; strong brown (7.5YR 5/6) loam; weak fine subangular blocky structure; friable; common roots; strongly acid; clear smooth boundary.

B21t—12 to 16 inches; yellowish brown (10YR 5/4) loam; moderate fine and medium subangular blocky structure; friable; few thin discontinuous clay films; few roots; strongly acid; clear wavy boundary.

B22t—16 to 38 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; friable; few thin discontinuous clay films; few roots; strongly acid; clear wavy boundary.

B3—38 to 42 inches; yellowish brown (10YR 5/6) loam; weak fine and medium subangular blocky structure; very friable; strongly acid; clear irregular boundary.

C—42 to 58 inches; brown (7.5YR 4/4) fine sandy loam; many medium and coarse distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/4) mottles; massive; very friable; 5 percent gravel by volume, less than one inch across; strongly acid.

Depth to bedrock ranges from 4 to 10 feet or more. Content of coarse fragments in the A and B horizons ranges from 0 to 15 percent, by volume. Coarse fragments make up 5 to 35 percent, by volume, of the C horizon. In undisturbed areas, the A1 horizon is dark brown or very dark grayish brown. The Ap horizon is brown, dark grayish brown, or dark brown loam, silt loam, or fine sandy loam. The B horizon is yellowish brown, strong brown, brown, or dark yellowish brown loam, silt loam, clay loam, silty clay loam, or fine sandy loam. Grayish mottles are below a depth of 30 inches. The C horizon is brown, yellowish brown, or brownish yellow mottled in shades of brown and gray.

Ag—Allegheny loam. This is a deep, well drained soil on low terraces along streams in the mountains. It is in tracts of 2 to 10 acres. Slopes are 0 to 3 percent.

Included with this soil in mapping were a few small areas where the surface layer and subsoil are gravelly. Also included were low spots where grayish mottles are between depths of 18 and 25 inches.

This soil is productive and easy to work. It is suited to a wide range of crops, such as corn, small grain, hay, and pasture. Tobacco and alfalfa are not well suited because of rare flooding. Flooding restricts the potential for most urban use. Capability unit I-1; woodland group 2o7.

Allen Series

The Allen series consists of deep, well drained, loamy soils. These soils are on foot slopes and benches below steep hills and mountains. They formed in material that moved downslope from the higher mountains, mainly Starr Mountain. Slopes range from 5 to 25 percent.

In a representative profile the surface layer is dark grayish brown loam about 3 inches thick. The subsurface layer is brown loam about 7 inches thick. The subsoil to a depth of 21 inches is yellowish brown and yellowish red, friable loam. Below this to a depth of 80 inches it is yellowish red and red, friable clay loam. A few small fragments of sandstone are scattered throughout the soil.

Allen soils are easy to work and respond well to management. These soils are strongly acid or very strongly acid throughout the profile. Where limed, the surface layer is less acid. Permeability is moderate, and the available water capacity is high.

Most steeper areas of these soils are in forest. Cleared areas are used for row crops, hay, and pasture.

Representative profile of Allen loam, 12 to 25 percent slopes:

A1—0 to 3 inches; dark grayish brown (10YR 4/2) loam; weak fine granular structure; very friable; common roots; few small fragments of sandstone; strongly acid; abrupt smooth boundary.

A2—3 to 10 inches; brown (10YR 5/3) loam; few fine faint pale brown mottles and common medium distinct yellowish brown (10YR 5/6) mottles; weak fine granular structure; very friable; common roots; few small fragments of sandstone; strongly acid; clear wavy boundary.

B1—10 to 15 inches; yellowish brown (10YR 5/4) loam; common medium distinct yellowish red (5YR 5/6) mottles; weak fine subangular blocky structure parting to weak medium granular; friable; common roots; few small fragments of sandstone; strongly acid; clear smooth boundary.

B21—15 to 21 inches; yellowish red (5YR 5/6) loam; few fine faint pale brown mottles and few medium distinct yellowish brown (10YR 5/6) mottles; weak fine and medium subangular blocky structure; friable; few roots; few small fragments of sandstone; very strongly acid; clear wavy boundary.

B22t—21 to 42 inches; yellowish red (5YR 4/6) clay loam; few medium distinct strong brown (7.5YR 5/6) and pale brown (10YR 6/3) mottles; weak fine and medium subangular blocky structure; friable; many discontinuous clay films; few small fragments of sandstone; very strongly acid; clear smooth boundary.

B23t—42 to 52 inches; red (2.5YR 5/6) clay loam; streaks of yellowish red (5YR 4/6) and yellowish brown (10YR 5/4); weak medium subangular blocky structure; friable; few thin discontinuous clay films; few fragments of sandstone as much as 6 inches across; very strongly acid; gradual smooth boundary.

B24t—52 to 80 inches; red (2.5YR 4/6) clay loam; few yellowish brown and pale brown sandy streaks; weak medium subangular blocky structure; friable; few thin discontinuous clay films on faces of peds; few 1- to 6-inch fragments of sandstone; very strongly acid.

Depth to bedrock is 6 to 15 feet or more. Fragments of sandstone, 1 inch to 10 inches across, make up 0 to 15 percent, by volume, of each horizon. The A2 or Ap horizon is brown, pale brown, or yellowish brown loam or fine sandy loam 5 to 10 inches thick. In severely eroded areas, the Ap horizon is strong brown or yellowish red clay loam. The B1 horizon is yellowish brown, strong brown, or yellowish red loam, clay loam, or sandy clay loam. The B2t horizon is yellowish red, red, or reddish yellow loam, sandy clay loam, or clay loam.

AnC—Allen loam, 5 to 12 percent slopes. This deep, well drained soil is mainly on benches and foot slopes at the base of Starr Mountain. It formed in sediment moved downslope from soils underlain by sandstone. The surface layer is brown, very friable, and is about 5 to 10 inches thick. The subsoil is dominantly yellowish red and red, friable clay loam several feet thick. Depth to bedrock is more than 6 feet.

Included with this soil in mapping were small areas of a similar soil that has slopes of more than 12 percent. Also included were spots where the surface layer is yellowish red clay loam because erosion has been severe. Some units include small areas of a soil that is more than 15 percent cobblestones throughout the profile.

This soil is suited to all crops commonly grown in the county. The slope is the main management concern. Suitable crops are corn, soybeans, burley tobacco, small grain, and vegetables. Tall fescue, alfalfa, orchardgrass, white clover, red clover, and lespedeza are suitable hay and pasture plants. The soil responds well to management. The potential is high for most urban use. Capability unit IIIe-3; woodland group 3o7.

AnD—Allen loam, 12 to 25 percent slopes. This deep, well drained soil is on foot slopes, mainly at the base of Starr Mountain. It has the profile described as representative of the series.

Included with this soil in mapping were patches of a severely eroded soil that has a yellowish red clay loam surface layer. Also included were small areas where slopes are more than 25 percent or less than 12 percent and a few areas where the soil is more than 15 percent sandstone fragments.

The slope is the main limitation of this soil to farming. The soil erodes easily if cultivated. It is suited to permanent pasture or woodland. Some suitable pasture plants are tall fescue, Midland bermudagrass, sericea lespedeza, white clover, and red clover. Because of the slope, the potential is medium for most urban use. Capability unit IVe-1; woodland group 3o7.

Altavista Series

The Altavista series consists of moderately well drained, loamy soils. These soils are on low terraces along streams in or near the mountains. They formed in sediment from a variety of rocks, including sandstone, shale, phyllite, and slate. Elevation generally is 1,000 to 2,000 feet. Slopes are 0 to 2 percent.

In a representative profile the surface layer is dark grayish brown silt loam about 8 inches thick. The subsoil, to a depth of 34 inches, is yellowish brown, friable silt loam or silty clay loam mottled with gray in the lower part. The underlying material to a depth of 52 inches is yellowish brown gravelly loam mottled in shades of gray, brown, and yellow. A few pebbles are in the surface layer and increase to 20 percent, by volume, in the lower part of the profile.

Altavista soils respond well to good management. They are strongly acid throughout the profile. Where limed, the surface layer is less acid. Permeability is moderate, and the available water capacity is high.

These soils are used mainly for corn, hay, and pasture. A few areas are in forest.

Representative profile of Altavista silt loam:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2)) silt loam; moderate medium granular structure; friable; few small gravel; many small roots; strongly acid; clear wavy boundary.

B1—8 to 14 inches; yellowish brown (10YR 5/4) silt loam; weak fine subangular blocky structure; friable; few small gravel, mainly quartzite; few roots; strongly acid; clear wavy boundary.

B21t—14 to 24 inches; yellowish brown (10YR 5/6) silty clay loam; common medium strong brown (7.5YR 5/6) and few fine faint gray mottles; moderate fine and medium subangular blocky structure; friable; few thin discontinuous clay films; few small shale, slate, and quartzite gravel; few fine roots; strongly acid; clear smooth boundary.

B22t—24 to 34 inches; yellowish brown (10YR 5/6) silty clay loam; many medium light brownish gray (10YR 6/2) and strong brown (7.5YR 5/6) mottles; moderate fine and medium subangular blocky structure; friable; many discontinuous clay films; few small gravel; strongly acid; clear smooth boundary.

C—34 to 52 inches; yellowish brown (10YR 5/6) gravelly loam; many medium to coarse distinct light brownish gray (10YR 6/2), strong brown (7.5YR 5/6) and brown (7.5YR 4/4) mottles; weak fine subangular blocky structure; friable; 20 percent by volume coarse fragments, mainly siltstone, phyllite, slate, and quartzite gravel and an occasional cobble and angular stone; strongly acid.

Coarse fragments, mainly waterworn gravel and cobbles, make up as much as 15 percent, by volume, of the A and B horizons and as much as 35 percent of the C horizon. Depth to bedrock ranges from 5 to 10 feet or more. Reaction is strongly acid. Where limed, the surface layer is less acid. The Ap horizon is dark grayish brown, brown, or yellowish brown. The B2t horizon is yellowish brown, light olive brown, brown, strong brown, dark yellowish brown, brownish yellow, or light yellowish brown. Gray mottles are within the upper 24 inches of the B2t horizon. The B2t horizon is silty clay loam, loam, or clay loam. The fine earth part of the C horizon ranges from loam to loamy sand.

As—Altavista silt loam. This is a moderately well drained soil on low terraces along streams in or near the mountains in tracts of 2 to 10 acres. Slopes are 0 to 2 percent.

Included with this soil in mapping were small areas of a soil that does not have gray mottles. Also included were spots where the soil is more than 15 percent gravel or coarse fragments throughout the profile.

The use of this soil is slightly limited by rare flooding and seasonal wetness. The soil is suited to most locally grown crops, except alfalfa, orchardgrass, small grain, and tobacco. The removal of excess water by open ditch or tile drainage broadens the use of this soil for farming. Because of the flooding and wetness, the potential is low for most urban use. Capability unit IIw-1; woodland group 2w8.

Atkins Series

The Atkins series consists of poorly drained, loamy soils on flood plains. These soils consist of sediment washed from mountains underlain by phyllite, slate, and sandstone.

In a representative profile the surface layer is dark grayish brown silt loam about 6 inches thick. The subsoil, to a depth of about 44 inches, is olive gray, friable loam and silt loam mottled in shades of brown and yellow. The underlying material to a depth of 60 inches is mottled gray and olive gray gravelly fine sandy loam.

Atkins soils are occasionally flooded for short periods, mainly in winter and spring. The water table stays near the surface for long periods during those seasons. The soils are strongly acid. Where limed, the surface layer is less acid. Permeability is moderate.

These soils are used largely for pasture. Water-tolerant bushes grow in a few areas.

Representative profile of Atkins silt loam:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; many medium brown (7.5YR 4/4) stains along old root channels and common fine faint grayish brown mottles; moderate medium granular structure; friable; many roots; strongly acid; clear smooth boundary.

B2g—6 to 24 inches; olive gray (5Y 5/2) silt loam; many medium distinct brown (7.5YR 4/4) mottles and few fine dark gray mottles; weak fine subangular blocky structure; friable; many roots; strongly acid; gradual wavy boundary.

B3g—24 to 44 inches; olive gray (5Y 5/2) loam; common fine and medium distinct dark gray (10YR 4/1) mottles and few medium distinct brown (7.5YR 4/4) mottles; massive; friable; few roots; strongly acid; abrupt wavy boundary.

Cg—44 to 60 inches; mottled gray (5Y 5/1) and olive gray (5Y 5/2) gravelly fine sandy loam; massive; very friable; 15 to 20 percent coarse fragments, mainly quartzite and phyllite gravel; strongly acid.

Coarse fragments, mainly waterworn quartzite, phyllite, and sandstone gravel, make up as much as 15 percent, by volume, of the A and B horizons and as much as 40 percent of the C horizon. The A horizon is silt loam or loam. The Ap horizon is dark grayish brown, grayish brown, or dark gray. A few undisturbed areas have a very dark gray A1 horizon 1 inch to 5 inches thick. The Bg horizon is mainly olive gray, gray, or light brownish gray silt loam, loam, fine sandy loam, or light silty clay loam. The C horizon is dominantly gray gravelly fine sandy loam, but is also stratified silt loam, loam, sandy loam, and gravel.

At—Atkins silt loam. This soil is in tracts of 2 to 3 acres on flood plains of creeks and branches in the mountains. It is grayish and poorly drained. It is flooded occasionally, and the water table is near the surface for long periods during winter and spring. Slopes are 0 to 2 percent. Included in mapping were small areas of a slightly browner, better drained soil.

Flooding and wetness are the main limitations to use. The soil is moderately permeable and can be drained by tile or open ditches. Drainage broadens its use to include such crops as corn and vegetables. Other crops, such as grain sorghum and soybeans, are better suited. Because of the wetness and occasional periods of flooding, the potential is low for such uses as dwellings, roadways, septic tank absorption systems, lagoons, and landfills. Capability unit IIIw-1; woodland group 2w9.

Beason Series

The Beason series consists of somewhat poorly drained soils. These soils formed in alluvium on low terraces and, to a lesser extent, on foot slopes and in depressions. Slopes are 0 to 2 percent.

In a representative profile the surface layer is dark grayish brown, friable silt loam about 6 inches thick. The subsoil is 34 inches thick. It is yellowish brown, mottled silty clay loam in the upper part; yellowish brown, mottled clay in the next part; and gray, mottled clay in the lower part. The underlying material to a depth of 60 inches or more is light gray and strong brown silty clay loam.

Beason soils are frequently flooded for brief periods. They are strongly acid throughout the profile. Where limed, the surface layer is less acid. Permeability is moderately slow, and the available water capacity is medium.

These soils are used for corn, soybeans, hay, and pasture.

Representative profile of Beason silt loam:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; strongly acid; abrupt smooth boundary.

B1—6 to 12 inches; yellowish brown (10YR 5/4) silty clay loam; few fine faint grayish brown mottles; moderate fine and medium subangular blocky structure; friable; few thin discontinuous clay films on faces of peds; strongly acid; clear smooth boundary.

B2t—12 to 30 inches; yellowish brown (10YR 5/4) clay; many coarse distinct yellowish red (5YR 5/6) and gray (5Y 6/1) mottles; moderate medium subangular blocky structure; firm; many thin discontinuous clay films on faces of peds; strongly acid; gradual smooth boundary.

B3g—30 to 40 inches; gray (2.5Y 6/1) clay; many coarse distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; strongly acid; gradual smooth boundary.

Cg—40 to 60 inches; mottled light gray (10YR 7/1) and strong brown (7.5YR 5/6) silty clay loam; weak medium subangular blocky structure; friable; strongly acid.

The Ap horizon ranges from 5 to 9 inches in thickness. The B1 and B2t horizons are yellowish brown, brown, or light yellowish brown silty clay loam, silty clay, or clay. The B3g and Cg horizons are dominantly gray mottled in shades of brown and yellow or brown or yellowish brown mottled with gray. These horizons range from clay loam to clay.

Ba—Beason silt loam. This is a somewhat poorly drained soil that has a clayey subsoil. It is in tracts of 2 to 5 acres, mainly on low terraces. Slopes are 0 to 2 percent.

Included with this soil in mapping were a few spots where a fragipan has formed at a depth of about 2 feet. Also included were a few small areas where no grayish mottles occur in the upper 10 inches of the subsoil and a few areas where the upper part of the subsoil is dominantly gray.

This soil is well suited to such crops as soybeans, tall fescue, grain sorghum, and annual lespedeza. Row crops can be grown every year because the soil is level and erosion is not a concern. If suitable outlets are available, a system of open ditches helps to remove the surface water and lower the water table. Improved drainage expands the use of the soil. The soil is too wet for such crops as small grain, tobacco, and alfalfa. Because of the wetness and flooding, the potential is low for such uses as septic tank absorption fields and sanitary landfills. Capability unit IIIw-3; woodland group 3w8.

Bland Series

The Bland series consists of well drained soils that formed in material weathered from reddish, argillaceous limestone. In many places these soils occur as small patches between massive outcrops of reddish rock. Between the rocks, the soil is 20 to 40 inches deep. In some places the rocks have been exposed by the soil sliding off the bedrock and moving downslope. Slopes are 10 to 50 percent.

In a representative profile the surface layer is dark reddish gray silt loam about 5 inches thick. The subsoil is weak red and reddish brown, firm and very firm, plastic clay that extends to the bedrock at a depth of 25 inches.

Bland soils are strongly acid, but range to neutral in the layer just above bedrock. The available water capacity is medium to low, and permeability is moderately slow.

These soils are used largely for unimproved pasture. Much of the acreage is in forest, most of which is second growth. Some of the acreage is idle.

Representative profile of Bland silt loam, 25 to 50 percent slopes:

Ap—0 to 5 inches; dark reddish gray (5YR 4/2) silt loam; moderate medium and fine subangular blocky structure; friable; many roots; strongly acid; clear smooth boundary.

B21t—5 to 8 inches; weak red (2.5YR 4/2) clay; strong medium subangular blocky structure; firm, plastic; common roots; few thin discontinuous clay films on the faces of peds; strongly acid; clear smooth boundary.

B22t—8 to 13 inches; reddish brown (2.5YR 4/4) clay; strong medium subangular blocky structure; very firm and plastic; common roots; few small fragments of reddish limestone; common thin discontinuous clay films on faces of peds; strongly acid; gradual smooth boundary.

B23t—13 to 25 inches; weak red (2.5YR 4/2) clay; strong medium subangular blocky structure; very firm and plastic; few roots; common small fragments of reddish limestone; few thin discontinuous clay films on faces of peds; medium acid.

R—25 inches; reddish argillaceous limestone.

Depth to bedrock ranges from 20 to 40 inches. The Ap horizon is dark reddish gray, reddish brown, or weak red silt loam or silty clay loam 4 to 7 inches thick. In a few severely eroded places it is yellowish red silty clay or clay. The B horizon is weak red, red, reddish brown, or yellowish red clay or silty clay.

BdD—Bland silt loam, 10 to 25 percent slopes. This well drained soil is in tracts of 5 to 20 acres. The surface layer is dark reddish gray or reddish brown and is 4 to 6 inches thick. The subsoil is red or weak red, very firm or firm, plastic clay or silty clay that extends to rock. Depth to argillaceous limestone is 20 to 40 inches.

Included with this soil in mapping were a few severely eroded areas where the surface layer is clay, a few areas where depth to bedrock is less than 20 inches, and some areas of rock outcrops. Also included were some hilltops where slopes are less than 10 percent and a few areas where the subsoil is clay loam.

This soil is suited to pasture and woodland. It is poorly suited to row crops because of the strong slope, the medium to low available water capacity, and the rapid erosion in cultivated areas. Tall fescue and bermudagrass are the best suited grasses. Eastern redcedar, Virginia pine, and loblolly pine are suggested for planting. Because of the slope, the moderate depth over rock, and the moderately slow permeability, the potential is low for most urban use. Capability unit VIe-2; woodland group 3c2.

BdE—Bland silt loam, 25 to 50 percent slopes. This steep, well drained soil is mainly on hillsides in tracts of 5 to 30 acres. It formed in material weathered from reddish, argillaceous limestone. It has the profile described as representative of the series.

Included with this soil in mapping were a few outcrops of reddish, argillaceous limestone. Also included were a few areas of a soil that is 40 to 50 inches deep over rock and has a loam and clay loam subsoil.

This soil is best suited to woodland. Pasture is difficult to establish and maintain because of the steep slopes. Loblolly pine, Virginia pine, and eastern redcedar are suggested for planting. Because of the steep slopes and the moderate depth over rock, the potential is low for most urban use. Capability unit VIIe-2; woodland group 3c3.

BnE—Bland-Rock outcrop complex, 25 to 50 percent slopes. This mapping unit consists of small areas of Bland soils and Rock outcrop that are so intermingled they could not be separated at the scale selected for mapping. It is on hillsides. Areas are about 3 to 15 acres in size.

Bland soils make up about 40 to 65 percent of the unit. The surface layer is dark reddish gray silt loam about 5 inches thick. The subsoil is weak red and reddish brown plastic clay that extends to the bedrock at a depth of 25 inches. These soils are strongly acid, but range from medium acid to neutral in the layer just above bedrock. Permeability is moderately slow, and the available water capacity is medium to low.

Rock outcrop of reddish, argillaceous limestone makes up to 25 to 45 percent of the unit. It occurs as narrow bands generally parallel to the slopes.

Included with this unit in mapping were several small areas of a soil less than 20 inches deep over bedrock and a few small severely eroded areas where the surface layer is silty clay or clay. Also included were a few narrow bands of a soil that is loam or clay loam throughout.

Most of this mapping unit is in forest. Eastern redcedar, Virginia pine, and mixed hardwoods are dominant. The potential is low for farming and urban use. Steep slopes, shallowness over bedrock, and rock outcrops are severe limitations. Capability unit VIIs-1; woodland group 4x3.

Brookshire Series

The Brookshire series consists of deep, well drained, loamy soils. These soils are on foot slopes and in coves in the mountains. They formed in sediment that moved downslope from soils weathered chiefly from sandstone, phyllite, and slate. Elevation is about 1,800 to 4,000 feet. Slopes are 20 to 40 percent.

In a representative profile the surface layer is very dark grayish brown and dark brown loam about 8 inches thick. Below this to a depth of 52 inches is brown and dark yellowish brown, friable loam that is gravelly in the lower part. Common small fragments of phyllite and sandstone are scattered throughout the profile. Partly weathered sandstone or quartzite is at a depth of 52 inches and extends to hard sandstone at a depth of 58 inches.

Brookshire soils are strongly acid throughout the profile. The available water capacity is high, and permeability is moderate or moderately rapid.

The soils are among the best suited in the county to trees. Practically all the acreage is high-quality forest.

Representative profile of Brookshire loam, 20 to 40 percent slopes:

A11—0 to 3 inches; very dark grayish brown (10YR 3/2) loam; moderate fine granular structure; very friable; many roots; common dark sandstone and phyllite fragments as much as 2 inches across; strongly acid; clear smooth boundary.

A12—3 to 8 inches; dark brown (10YR 3/3) loam; moderate medium granular structure; very friable; many roots; common phyllite and dark sandstone fragments as much as 2 inches across; strongly acid; clear smooth boundary.

B1—8 to 16 inches; brown (7.5YR 4/4) loam, few coatings and streaks of dark brown (10YR 3/3); weak medium subangular blocky structure; friable; common roots; common phyllite and dark sandstone fragments as much as 2 inches across; strongly acid; gradual smooth boundary.

B2—16 to 36 inches; brown (7.5YR 4/4) loam; weak medium subangular blocky structure; friable; common roots; common phyllite and dark sandstone fragments as much as 2 inches across; strongly acid; clear smooth boundary.

C—36 to 52 inches; dark yellowish brown (10YR 4/4) gravelly loam; massive; friable; few roots; about 25 percent soft and hard dark sandstone and phyllite fragments as much as 4 inches across; strongly acid; gradual wavy boundary.

R1—52 to 58 inches; partly weathered dark sandstone or weakly metamorphosed quartzite; dark yellowish brown loam coating rock fragments and extending into cracks; soft part of rock crushes into brown (10YR 5/3) sandy loam.

R2—58 inches; hard sandstone rock.

Depth to hard bedrock ranges from about 3½ to 6 feet or more. The solum ranges from 30 to 55 inches in thickness. Coarse fragments of sandstone, conglomerate, slate, phyllite, and quartzite make up about 10 to 30 percent, by volume, of the A and B horizons and from about 10 to 40 percent of the C horizon. The A horizon is very dark grayish brown or dark brown silt loam or loam 6 to 10 inches thick. The B horizon is brown or dark yellowish brown silty loam or loam. The C horizon is dark yellowish brown, brown, or yellowish brown loam or silt loam.

BrE—Brookshire loam, 20 to 40 percent slopes. This is a deep, well drained soil on the lower parts of mountainsides. Typically, it is in coves or covelike positions below steep mountains underlain mainly by sandstone, phyllite, or slate. Included in mapping were some areas that have numerous cobblestones on the surface and throughout the profile.

Practically all the acreage is forest. Yellow-poplar, northern red oak, sugar maple, yellow birch, and white pine are dominant. A very small part, generally the less sloping areas, is used for pasture and provides wildlife openings. The slope is the main limitation and restricts the potential of the soil for uses other than woodland. Roadbanks are unstable and subject to landslides if cuts are made. Capability unit VIe-1; woodland group 2r8.

Calvin Series

The Calvin series consists of moderately deep, shaly, and excessively drained soils. These soils are on hillsides and ridgetops. They formed in material weathered from maroon or reddish shale. Slopes are 5 to 40 percent.

In a representative profile the surface layer is dark reddish brown silt loam about 3 inches thick. Below this is reddish brown shaly silt loam that extends to shale bedrock at a depth of about 22 inches.

Calvin soils are low in natural fertility and are strongly acid, except where limed. Response to management is poor. The available water capacity is low, and permeability is moderately rapid. Runoff is medium to rapid.

These soils are used mainly for pasture and woodland.

Representative profile of Calvin silt loam, 20 to 40 percent slopes:

A1—0 to 3 inches; dark reddish brown (5YR 3/3) silt loam; weak medium granular structure; very friable; many roots; 10 percent by volume fragments of reddish shale; strongly acid; abrupt smooth boundary.

B1—3 to 10 inches; reddish brown (5YR 4/3 shaly silt loam; moderate fine granular structure; friable; many roots; 15 percent by volume fragments of reddish shale; strongly acid; clear smooth boundary.

B2—10 to 14 inches; reddish brown (5YR 4/3) shaly silt loam; weak fine subangular blocky structure; friable; few roots; 50 percent by volume fragments of reddish shale; strongly acid; abrupt smooth boundary.

C—14 to 22 inches; reddish brown (5YR 4/4) shaly silt loam; massive; friable; about 75 percent by volume fragments of reddish shale; strongly acid.

R—22 inches; reddish shale.

The A horizon is dark reddish brown or reddish brown silt loam, loam, or shaly silt loam 3 to 6 inches thick. The B horizon is reddish brown, dark reddish brown, or dusky red shaly silty clay loam or shaly silt loam. Depth to rock is about 24 inches in most places but ranges from 20 to 40 inches. The content of reddish shale fragments ranges from 5 to 20 percent by volume, in the A horizon, 25 to 55 percent in the B2 horizon, and 40 to 80 percent in the C horizon.

CaD—Calvin silt loam, 5 to 20 percent slopes. This moderately deep, well drained, shaly soil is on narrow ridgecaps, chiefly in the Rural Vale community. The surface layer is reddish brown or dark reddish brown silt loam or loam about 3 to 6 inches thick. The subsoil is reddish brown, dark reddish brown, or dusky red shaly silt loam or shaly silty clay loam that is 25 to 50 percent reddish shale fragments.

Included with this soil in mapping on foot slopes and along narrow drainageways were small areas of a soil that is more than 40 inches deep over rock. Also included were some small areas where the surface layer is more than 15 percent shale fragments, a few areas where shallow gullies have formed, and some small areas on the points of ridges where the soil is less than 20 inches deep over bedrock.

The slope, the content of shale, and the low available water capacity limit the use of this soil for farming. Tall fescue, sericea lespedeza, and bermudagrass are some of the best suited pasture plants. The shale rock is tight bedded and nearly impervious to water and roots.

This soil is best suited to trees, mainly Virginia pine, loblolly pine, and shortleaf pine. Hardwoods, such as southern red oak, redbud, sugar maple, and hickory, are only fairly well suited. Because of the slope and the moderate depth over shale bedrock, the potential is low for most urban use. Capability unit VIe-3; woodland group 4f3.

CaE—Calvin silt loam, 20 to 40 percent slopes. This moderately deep, well drained, shaly soil is on steep hillsides in areas underlain by maroon shale. It has the profile described as representative of the series. The surface layer is reddish brown and is 3 to 6 inches thick. The subsoil is reddish brown, dark reddish brown, or dusky red shaly silty clay loam or shaly silt loam. Maroon or reddish shale bedrock is at a depth of about 22 inches, but the depth ranges from 20 to 40 inches.

Included with this soil in mapping were small areas where the soil is less than 20 inches deep over bedrock. Also included were a few shallow gullies and a few spots where the soil material has washed away and exposed the bedrock.

The steep slopes, the moderate depth over rock, and the low available water capacity are severe limitations to farming. Pasture is difficult to establish, and response to management is low. Tall fescue, sericea lespedeza, and bermudagrass are suited.

This soil is best suited to trees, mainly loblolly pine, shortleaf pine, and Virginia pine. Deep cuts can result in massive landslides. The potential is low for urban use. Capability unit VIIe-2; woodland group 4f3.

Cataska Series

The Cataska series consists of moderately deep, excessively drained soils that formed in material weathered from phyllite or slate. These soils are on mountainsides. Elevation is 2,000 to 4,500 feet. Slopes are 35 to 75 percent.

In a representative profile the surface layer is very dark grayish brown channery silt loam 1 inch thick. The subsurface layer is dark grayish brown channery silt loam 5 inches thick. The subsoil, to a depth of 16 inches, is yellowish brown channery silt loam that is 65 percent, by volume, phyllite fragments. Below this is soft phyllite that has seams and cracks filled with yellowish brown silt loam. Hard rock is at a depth of 28 inches.

Cataska soils are strongly acid or very strongly acid. Permeability is moderate, and the available water capacity is low or very low.

Practically all the acreage is forest.

Representative profile of Cataska channery silt loam, in an area of Cataska-Rock outcrop complex, 35 to 75 percent slopes:

O2—½ inch to 0; nearly black partly decomposed organic mat of hardwood leaves and pine needles.

A1—0 to 1 inch; very dark grayish brown (10YR 3/2) channery silt loam; weak fine granular structure; very friable; many roots; abrupt smooth boundary.

A2—1 inch to 6 inches; dark grayish brown (10YR 4/2) channery silt loam; weak medium and fine granular structure; friable; many roots; about 25 percent by volume fragments of phyllite less than ½ inch thick and ranging from 1 inch to 4 inches long; strongly acid; clear wavy boundary.

B2—6 to 16 inches; yellowish brown (10YR 5/6) channery silt loam; weak medium and fine subangular blocky and medium granular structure; friable; common roots; about 65 percent by volume of fragments of phyllite as much as ½ inch thick and 1 inch to 8 inches long; strongly acid; gradual wavy boundary.

C—16 to 28 inches; nearly vertically tilted phyllite rock; can be removed with hard tools; narrow occasional cracks less than ¼ inch wide filled with yellowish brown (10YR 5/6) silt loam; few large roots; some partings in the tilted rocks have only films or coatings of soil material on the rocks; strongly acid.

R—28 inches; hard fractured phyllite.

Depth to hard bedrock ranges from 20 to 40 inches. Soft rock is at a depth of less than 20 inches. The content of slate or phyllite fragments ranges from 25 to 75 percent in each horizon. The A2 horizon is dark grayish brown, grayish brown, or brown. The B horizon is yellowish brown, dark yellowish brown, brown, or strong brown. The C horizon is similar in color and texture to the B horizon.

CcF—Cataska-Rock outcrop complex, 35 to 75 percent slopes. This mapping unit consists of small areas of Cataska soil and Rock outcrop that are so intermingled they could not be separated at the scale selected for mapping. It is in the Unaka Mountains, mostly on the crests of ridges, in gorges, and on side slopes adjacent to streams. Elevation ranges from about 2,000 to 4,500 feet.

The Cataska soil makes up about 45 to 65 percent of the unit. It has the profile described as representative of the Cataska series. Permeability is moderate, and the available water capacity is low to very low. The soil is strongly acid or very strongly acid.

Rock outcrop of phyllite and slate makes up 25 to 40 percent of the unit.

Included with this unit in mapping were small areas of Sylco, Ditney, and Unicoi soils. Also included on ridgetops were some small areas where slopes are less than 35 percent.

Most of the acreage is forest. The potential is low for farming and urban use. The steep slopes, rock outcrop, and shallowness over bedrock are severe limitations. Capability unit VIIs-1; woodland group 5f3.

Chagrin Series

The Chagrin series consists of deep, well drained, loamy soil on bottom land of creeks and rivers. These soils formed in sediment washed from soils underlain by limestone, shale, phyllite, and slate. Slopes are less than 2 percent.

In a representative profile the soil is brown, friable silt loam to a depth of 50 inches or more. A few pebbles are scattered throughout the soil.

Chagrin soils are medium acid to neutral throughout the profile. They are occasionally flooded, generally for only a few hours and most commonly late in winter and early in spring. Permeability is moderate, and the available water capacity is high.

These soils are used for corn, tobacco, vegetables, hay, and pasture. They are among the most productive soils in the county.

Representative profile of Chagrin silt loam:

Ap—0 to 10 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; neutral; clear smooth boundary.

B—10 to 28 inches; brown (10YR 4/3) silt loam; ped coatings of dark yellowish brown (10YR 3/4); moderate fine and medium granular structure; friable; slightly acid; few pebbles; gradual wavy boundary.

C—28 to 50 inches; brown (10YR 4/3) silt loam; few medium faint dark yellowish brown (10YR 4/4) mottles; weak fine and medium granular structure; friable; slightly acid.

The Ap horizon is brown or dark grayish brown, friable silt loam or fine sandy loam 7 to 12 inches thick. The B and C horizons are brown or yellowish brown silt loam, loam, or fine sandy loam. Mottles in shades of brown and gray range from none to common below a depth of 24 inches and become more numerous below a depth of 30 inches. The content of gravel in the soil ranges from none to about 10 percent, by volume.

Cg—Chagrin silt loam. This is a deep, well drained soil. It is in tracts of mostly 2 to 5 acres on the first bottoms of creeks and rivers. Slopes range from 0 to 2 percent.

Included with this soil in mapping were a few small, low-lying areas of a soil that has gray mottles between depths of 12 to 24 inches. Also included were a few small areas along drainageways of a soil that is reddish and a few areas where slopes are more than 2 percent.

This is one of the most productive soils in the county. It is well suited to row crops every year. Occasional flooding is the main concern in use and management. All crops commonly grown are well suited. Because of flooding, the potential is low for most urban use. Capability unit I-1; woodland group 2o7.

Christian Series

The Christian series consists of deep, well drained soils. These soils formed in material weathered from shale that contains appreciable amounts of sand. The landscape is one of moderately high, rounded hills dissected by deep, crooked drainageways or hollows. The soils most commonly are next to Dandridge and Tellico soils. Slopes are 3 to 25 percent.

In a representative profile the surface layer is brown loam about 8 inches thick. The subsoil is about 47 inches thick. It is yellowish red, friable clay loam in the upper part; yellowish red, firm clay in the next part; and mottled yellowish red, firm shaly clay loam in the lower part. Sandy shale is at a depth of 55 inches.

Christian soils erode easily and rapidly if cultivated. They are strongly acid or very strongly acid. Where limed, the surface layer is less acid. Permeability is moderate, and the available water capacity is medium.

These soils are used mostly for pasture. Much of the acreage is idle or is in hardwood and pine trees and bushes.

Representative profile of Christian loam, 3 to 12 percent slopes:

Ap—0 to 8 inches; brown (10YR 5/3) loam; weak medium and fine granular structure; very friable; many roots; strongly acid; clear smooth boundary.

B1—8 to 13 inches; strong brown (7.5YR 5/6) clay loam; moderate medium and fine subangular blocky structure; friable; common roots; few thin discontinuous clay films on faces of peds; strongly acid; clear smooth boundary.

B21t—13 to 21 inches; yellowish red (5YR 5/6) clay loam; strong medium subangular blocky structure; firm; common roots; few discontinuous clay films on faces of peds; very strongly acid; clear smooth boundary.

B22t—21 to 26 inches; yellowish red (5YR 5/6) clay; few fine faint strong brown and yellowish brown mottles; moderate medium subangular blocky structure; firm; few roots; few thin discontinuous clay films on faces of peds; very strongly acid; gradual smooth boundary.

B23t—26 to 44 inches; yellowish red (5YR 5/6) clay; few fine and medium faint yellowish brown and red mottles; moderate medium subangular blocky structure; firm; few fine roots; few thin discontinuous clay films on faces of peds; very strongly acid; gradual smooth boundary.

B3—44 to 55 inches; yellowish red (5YR 5/6) shaly clay loam; common medium distinct yellowish brown (10YR 5/6) and red (2.5YR 5/6) mottles; weak medium subangular blocky structure, some of which parts along shale bedding planes; firm; about 25 percent by volume fragments of soft sandy shale; very strongly acid; gradual wavy boundary.

R—55 to 70 inches; soft brownish and yellowish sandy shale; can be dug with a spade.

The A horizon is brown or light yellowish brown loam or fine sandy loam 4 to 8 inches thick. In severely eroded areas, it is strong brown or yellowish red clay loam. The B1 horizon is strong brown or yellowish red loam or clay loam. The B2 and B3 horizons are yellowish red or red clay loam or clay. The content of soft shale fragments ranges from 10 to 35 percent in the B3 horizon. Depth to sandy shale ranges from 4 to 7 feet.

ChC—Christian loam, 3 to 12 percent slopes. This well drained soil is mainly on the tops of hills and is deep over rock. Most areas are less than 6 acres in size. The soil has the profile described as representative of the series. The surface layer ranges from 4 to 8 inches in thickness. Included in mapping were a few areas of a soil that is about 20 to 30 inches deep over shale.

More than 50 percent of the acreage is idle and under bushy vegetation. Because most areas are small and irregular in shape, they are not suitable for use as separate fields. The soil, however, is suited to most of the locally grown crops, such as corn, tobacco, small grain, tall fescue, orchardgrass, and white clover. The hazard of erosion is the main limitation to cultivation. The potential is medium for most urban use. Capability unit IIIe-3; woodland group 3o7.

ChD—Christian loam, 12 to 25 percent slopes. This soil is on fairly short hillsides in tracts of 5 to 20 acres. It formed in material weathered from shale that contains appreciable amounts of sand. The surface layer is brown, friable, and 4 to 8 inches thick. The subsoil is yellowish red clay loam or clay. Depth to sandy shale rock is about 4 to 7 feet.

Included with this soil in mapping were a few very small areas of a soil that is about 20 to 30 inches deep over shale. Also included were numerous small, severely eroded areas that have a yellowish red clay loam surface layer.

The slope and high erodibility are the main considerations in the use and management of this soil. If cultivated or disturbed, the loamy surface layer erodes rapidly. The soil is not suited to cultivated crops because it is susceptible to erosion. It is suited to hay and pasture if adequately fertilized. Tall fescue, bermudagrass, white clover, annual lespedeza, and sericea lespedeza are suited. The potential is medium or low for most urban use. Capability unit IVe-1; woodland group 3o7.

CnD3—Christian clay loam, 12 to 25 percent slopes, severely eroded. This moderately steep soil is in tracts of 3 to 6 acres on hillsides. It is deep, well drained, and is about 4 to 5 feet deep over sandy shale rock. The surface layer is yellowish red and is 4 to 6 inches thick. The subsoil is yellowish red clay loam or clay.

Included with this soil in mapping were spots where 3 or 4 inches of the surface layer is the original brown loam. Also included were some areas where a few shallow gullies have formed and a few where the soil is about 15 to 30 inches deep over shale rock.

This soil is fairly well suited to hay or pasture. Tall fescue, bermudagrass, white clover, and sericea lespedeza are suited. Fertilizer requirements are high. Because of the moderately steep slopes and the hazard of further erosion, this soil is poorly suited to tilled crops. Much of the acreage is idle or is reverting to woodland. The soil is best suited to trees, particularly Virginia pine and loblolly pine. The potential is low for urban use. Capability unit VIe-1; woodland group 4c3e.

Citico Series

The Citico series consists of deep, well drained, loamy soils in the mountains. These soils formed in material that crept downslope over a long period of time. They are in coves and on the lower parts of steep mountainsides underlain by phyllite or slate rock. Slopes range from about 20 percent on the foot slopes or benchlike positions to about 40 percent on the steepest mountainsides.

In a representative profile the surface layer is very dark grayish brown and brown channery silt loam about 7 inches thick. Below this is yellowish brown and brown, friable channery silt loam that extends to phyllite bedrock at a depth of 48 inches. Channers or thin flat phyllite and slate fragments range from less than 1 inch to about 4 inches in length.

Citico soils are strongly acid. The available water capacity is high, and permeability is moderate.

Nearly all the acreage is high-quality forest, chiefly yellow-poplar, white oak, northern red oak, sugar maple, red maple, hickory, white pine, and hemlock.

Representative profile of Citico channery silt loam, 20 to 40 percent slopes:

O1—2 inches to 1 inch; pine needles and hardwood leaves and twigs.
O2—1 inch to 0; black organic mat of partly decomposed leaf litter.
A1—0 to 2 inches; very dark grayish brown (10YR 3/2) channery silt loam; moderate medium granular structure; friable; many roots; about 15 percent by volume fragments of thin phyllite as much as 2 inches long; strongly acid; abrupt smooth boundary.
A3—2 to 7 inches; brown (10YR 5/3) channery silt loam; moderate medium granular and weak fine subangular blocky structure; friable; many roots; about 15 percent by volume fragments of phyllite as much as 3 inches long and ⅛ inch thick; strongly acid; gradual wavy boundary.
B2—7 to 19 inches; yellowish brown (10YR 5/4) channery silt loam; weak medium subangular blocky structure; friable; common roots; about 20 percent by volume fragments of phyllite as much as 3 inches long and ¼ inch thick; strongly acid; gradual wavy boundary.
B3—19 to 38 inches; yellowish brown (10YR 5/4) channery silt loam; weak medium subangular blocky structure; friable; common roots; 20 percent by volume fragments of phyllite as much as 4 inches long and ¼ inch thick; strongly acid; gradual wavy boundary.
C—38 to 48 inches; brown (10YR 5/3) channery silt loam; massive; friable; few roots; 40 percent by volume fragments of phyllite as much as 12 inches long and 1 inch thick; strongly acid.
R—48 inches; hard phyllite rock.

Depth to bedrock, largely phyllite, ranges from 40 to 60 inches. The content of coarse phyllite and slate fragments ranges from 15 to 35 percent in the A and B horizons and from 15 to 45 percent in the C horizon. The soil is strongly acid. The A horizon is channery silt loam or channery loam. The B horizon is yellowish brown, brown, strong brown, or dark yellowish brown channery silt loam. The C horizon is similar to the B horizon in color and texture, but in some places it contains a few grayish brown or yellowish red mottles.

CtE—Citico channery silt loam, 20 to 40 percent slopes. This is a deep, well drained soil on the lower mountainsides, typically in concave areas and in coves. The surface layer is brown and the subsoil is yellowish brown, friable channery silt loam. The flagstones consist mainly of thin, flat phyllite, but some are sandstone and quartzite. Included in mapping were soils where slopes are more than 40 percent or less than 20 percent.

Most of the acreage of this productive soil is forest. Yellow-poplar, white oak, northern red oak, sugar maple, red maple, hickory, white pine, and hemlock are dominant. A few of the smoother slopes are suited to hay and pasture. Because of the steep slopes, the potential is low for most farm and urban use. Capability unit VIe-1; woodland group 2r8.

Dandridge Series

The Dandridge series consists of shallow, excessively drained, shaly soils. These soils are on highly dissected hills and ridges. They formed in material weathered from calcareous shale. The soils are locally called "black slate land." Slopes are 5 to about 60 percent.

In a representative profie the surface layer is dark grayish brown shaly silty clay loam about 6 inches thick. The subsoil is yellowish brown shaly silty clay about 8 inches thick. Calcareous shale is at a depth of 14 inches.

Dandridge soils are rather difficult to work, but are fairly responsive to good management. They are slightly acid, neutral, or mildly alkaline. Permeability is moderately slow, and the available water capacity is low.

These soils are used mainly for pasture. Small patches of corn, hay, and tobacco are also grown. About one-fourth of the acreage is in forest.

Representative profile of Dandridge shaly silty clay loam, 5 to 20 percent slopes:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) shaly silty clay loam; moderate and strong medium granular structure; friable; many fine roots; 20 percent by volume fragments of shale; neutral; clear wavy boundary.
B—6 to 14 inches; yellowish brown (10YR 5/4) shaly silty clay; moderate medium subangular blocky structure; firm; common fine roots; 45 percent by volume fragments of calcareous shale; neutral; clear wavy boundary.
R1—14 to 17 inches; calcareous shale and a few thin coatings of brownish clayey soil material on shale fragments and seams extending into cracks.
R2—17 inches; hard calcareous shale bedrock.

The Ap horizon is dark grayish brown, brown, or yellowish brown shaly silt loam or shaly silty clay loam 4 to 6 inches thick. Fragments of shale, 1 inch to 5 inches in diameter, make up as much as 15 to 50 percent of all horizons. In wooded areas, the A horizon is dark grayish brown shaly silt loam about 2 inches thick. The B horizon is yellowish brown, strong brown, or dark yellowish brown shaly silty clay loam or shaly silty clay. Depth to shale bedrock is 6 to 20 inches.

DaD—Dandridge shaly silty clay loam, 5 to 20 percent slopes. This soil is mainly on the tops of high hills. It formed in material weathered from calcareous shale, which is locally called "black slate." The soil is about 6 to 20 inches deep over hard shale rock. It has the profile described as representative of the series.

Included with this soil in mapping were small areas where the surface layer is shaly silty clay and a few areas where it is shaly silt loam. Also included on broad hilltops were a few nearly level spots of soils that have a fragipan.

This soil is best suited to pasture and some hay crops. Plants generally make good growth during spring when moisture is plentiful, but growth is very limited in summer. Tall fescue, white clover, sericea lespedeza, and bermudagrass are best suited. The soil erodes easily if cultivated. Suitable trees are Virginia pine, white pine, and eastern redcedar. Fields left idle generally revert to Virginia pine and eastern redcedar.

Because of the moderately slow permeability, this soil is suited as sites for ponds or lakes, but fill material for the dam is frequently scarce. Because the soil is shallow over bedrock, the potential is low for most urban use. Capability unit VIe-3; woodland group 4d2.

DaE—Dandridge shaly silty clay loam, 20 to 35 percent slopes. This steep soil is on rounded hillsides. It is about 6 to 20 inches deep over hard calcareous shale. The surface layer is brown shaly silty clay loam 4 to 6 inches thick. The subsoil is yellowish brown shaly silty clay. Fragments of soft and hard shale, 1 inch to 5 inches long, make up about 50 percent of the soil, by volume.

Included with this soil in mapping were some very small areas of a soil that is 20 to 30 inches deep and has a yellowish red subsoil. Also included were a few spots where the soft shale is exposed.

This soil is fairly well suited to pasture. Tall fescue, bluegrass, and sericea lespedeza make good growth in spring and early in summer. Because of the low available water capacity, pasture is highly susceptible to overgrazing. The steep slopes and the hazard of erosion are the main limitations to cultivation. The soil is suited to trees, mainly oak, hickory, locust, pine, and cedar. Virginia pine and redcedar seed voluntarily in idle fields. The potential is low for urban use, such as dwellings, septic tank absorption fields, and local roads. Capability unit VIe-3; woodland group 4d3.

DaF—Dandridge shaly silty clay loam, 35 to 60 percent slopes. This very steep soil is on dissected shale hillsides. Some areas adjacent to creeks form bluffs. The soil is about 6 to 20 inches deep over calcareous shale rock, and fragments of shale are throughout the soil. The surface layer is brown and is 4 to 6 inches thick. The subsoil is yellowish brown sandy silty clay that extends to bedrock.

Included with this soil in mapping were a few spots of a soil that has a yellowish red subsoil and is 20 to 30 inches deep over rock. Also included were a few areas of a similar soil that formed in residuum from sandy shale. In these areas the surface layer is loam.

Practically all areas are forested and the soil is well suited to this use. Low-quality Virginia pine and eastern redcedar are dominant. The potential is low for most farm and urban use. Capability unit VIIe-2; woodland group 4d3.

Decatur Series

The Decatur series consists of deep, well drained soils. These soils are on low hills in the limestone valley uplands. They formed either in deep noncherty limestone residuum or in old alluvium. Slopes are 2 to 20 percent.

In a representative profile the surface layer is dark reddish brown silt loam about 6 inches thick. The upper 8 inches of the subsoil is dark reddish brown silty clay loam, and the lower 58 inches is dark red clay. Limestone bedrock is at a depth of more than 6 feet.

Decatur soils are fairly easy to work and respond well to good management. They are strongly acid or very strongly acid throughout the profile. Where limed, the surface layer is less acid. Permeability is moderate, and the available water capacity is medium.

These soils are used for corn and tobacco and are especially well suited to small grain, hay, and pasture.

Representative profile of Decatur silt loam, 2 to 5 percent slopes:

Ap—0 to 6 inches; dark reddish brown (5YR 3/2) silt loam; weak medium granular structure; friable; many medium and fine roots; medium acid; abrupt smooth boundary.

B1—6 to 14 inches; dark reddish brown (2.5YR 3/4) silty clay loam; moderate fine subangular blocky structure; friable; many medium and fine roots; medium acid; clear smooth boundary.

B21t—14 to 20 inches; dark red (2.5YR 3/6) clay; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; few thin continuous clay films on faces of peds; few soft dark brown concretions; strongly acid; gradual smooth boundary.

B22t—20 to 40 inches; dark red (10R 3/6) clay; moderate medium and coarse subangular blocky structure; firm, sticky and plastic; common thin continuous clay films on faces of peds; few fine brown concretions; strongly acid; gradual smooth boundary.

B23t—40 to 60 inches; dark red (10R 3/6) clay, dark reddish brown (2.5YR 3/4) crushed; moderate medium and coarse subangular blocky structure; firm, sticky and plastic; few thin continuous clay films on faces of peds; few fine brown concretions; strongly acid; gradual smooth boundary.

B24t—60 to 72 inches; dark red (2.5YR 3/6) clay; weak coarse subangular blocky structure; firm, sticky and plastic; few thin continuous clay films on faces of peds; common fine brown concretions; strongly acid.

The Ap horizon is dark reddish brown or dark red silt loam, silty clay loam, or, rarely, loam 3 to 10 inches thick. The B horizon is dark red, dark reddish brown, or dusky red silty clay loam, silty clay, or clay several feet thick. Depth to limestone is more than 6 feet.

DcB—Decatur silt loam, 2 to 5 percent slopes. This deep, well drained soil is in tracts of 2 to 10 acres on the tops of low rolling hills. It has the profile described as representative of the series. The surface layer is 4 to 8 inches thick. In most areas, some subsoil material has been mixed into the surface layer by plowing. Included in mapping were small eroded areas where the surface layer is silty clay loam and a few areas where it is dark brown and the subsoil is red.

This soil is well suited to all crops commonly grown in the county. It is suited to row crops, hay, and pasture. Corn, soybeans, small grain, alfalfa, burley tobacco, orchardgrass, tall fescue, clovers, annual lespedeza, sericea lespedeza, and vegetables are suited. The hazard of erosion is a slight limitation to cultivated crops. The potential is high for dwellings, industrial use, and other urban use. Capability unit IIe-2; woodland group 3o7.

DcC—Decatur silt loam, 5 to 12 percent slopes. This deep, well drained soil is on low, rolling hilltops in the limestone valleys. It is in tracts of 2 to 15 acres. The surface layer is dark reddish brown and is about 4 to 7 inches thick. In most cultivated areas, some of the subsoil has been mixed into the surface layer. The subsoil is dark red clay several feet thick. Limestone bedrock is at a depth of more than 6 feet. Included in mapping were some small severely eroded areas where the surface layer is dark red silty clay loam or clay.

This soil is well suited to all locally grown crops, such as corn, soybeans, small grain, alfalfa, burley tobacco, orchardgrass, tall fescue, annual lespedeza, sericea lespedeza, white clover, and red clover. The response to management is excellent. The hazard of erosion is the main limitation to farming. The potential is high for dwellings and other urban use. Capability unit IIIe-2; woodland group 3o7.

DcD2—Decatur silt loam, 12 to 20 percent slopes, eroded. This deep, well drained, moderately steep soil is on low-lying hillsides in the smoother limestone valleys. It is in tracts of 2 to about 15 acres. The surface layer is dark reddish brown and is about 5 to 7 inches thick. In most cultivated areas, some of the subsoil material has been mixed into the surface layer. The subsoil is dark red clay several feet thick. Depth to limestone rock is more than 6 feet.

Included with this soil in mapping were small, severely eroded areas where the surface layer is silty clay loam or clay. Also included were a few small areas where the surface layer is dark brown silt loam and the subsoil is red silty clay or clay and a few areas where slopes are more than 20 percent.

This soil is fairly well suited to all commonly grown row crops, such as corn, tobacco, small grain, and vegetables. It is especially well suited to hay and pasture plants, such as tall fescue, orchardgrass, annual lespedeza, sericea lespedeza, alfalfa, and most clovers. The slope is the main limitation to cultivated crops and other uses. In cultivated areas, erosion is serious and soil-conserving measures are important. No-till planting is an example of a conservation practice that decreases the hazard of erosion. The potential is medium for most urban use, but is low for lagoons and light industry. Capability unit IVe-2; woodland group 3o7.

DdC3—Decatur silty clay loam, 5 to 12 percent slopes, severely eroded. This deep, well drained soil is in small areas on the tops of low, rolling hills. It is in tracts of 2 to 5 acres on convex side slopes. The plow layer is dark reddish brown and dark red and is about 4 to 7 inches thick. The subsoil is dark red clay several feet thick. Depth to limestone bedrock is more than 6 feet. A few shallow gullies occur in this soil. Included in mapping were a few small areas where the surface layer is clay and a few areas where it is silt loam.

This soil is fairly well suited to all crops commonly grown in the county. Because of erosion, the plow layer is somewhat clayey and is difficult to work. Germination and seedling establishment are difficult. Controlling erosion is the main management concern. Runoff and soil loss can be reduced by a suitable cropping system. Corn, burley tobacco, small grain, grain sorghum, alfalfa, annual lespedeza, sericea lespedeza, tall fescue, orchardgrass, white clover, and red clover are suited. The potential is high for dwellings with septic tank absorption systems, but is medium for most other urban use. Capability unit IVe-2; woodland group 4c3e.

DdD3—Decatur silty clay loam, 12 to 20 percent slopes, severely eroded. This deep, well drained soil is in tracts of 2 to 10 acres on low-lying hillsides in the broader limestone valleys. The surface layer is dark red and dark reddish brown and is 3 to 5 inches thick. The subsoil is dark red clay several feet thick. Depth to limestone bedrock is more than 6 feet. A few shallow gullies occur in this soil.

Included with this soil in mapping were a few small areas where the surface layer is silt loam and many small areas where it is dark red clay. Also included were some areas where slopes are more than 20 percent.

This soil is fairly well suited to all commonly grown crops. The slope, the thin surface layer, and the hazard of erosion are the main management concerns in farming. The soil is well suited to hay and pasture, such as alfalfa, sericea lespedeza, orchardgrass, tall fescue, Midland bermudagrass, white clover, and red clover. Seedbed preparation and establishment of sod are sometimes difficult because of the poor workability and the thin surface layer. The potential is medium for most urban use, such as dwellings, sanitary landfills, roads, and septic tank absorption fields. It is low for sewage lagoons and light industry. Capability unit VIe-1; woodland group 4c3e.

Dewey Series

The Dewey series consists of very deep, well drained soils. These soils are on ridgetops and hillsides of the broad limestone valley (fig. 4). They formed in 1 foot to 2 feet of old alluvium and the underlying residuum weathered from limestone. Slopes are 2 to 20 percent.

In a representative profile the surface layer is dark reddish brown silt loam about 6 inches thick. The upper 4 inches of the subsoil is dark reddish brown, friable silty clay loam. Below this to a depth of 72 inches is firm, red, dark red, and dark reddish brown clay.

Dewey soils are strongly acid throughout the profile. Where limed, the surface layer is less acid. The available water capacity is medium, and permeability is moderate.

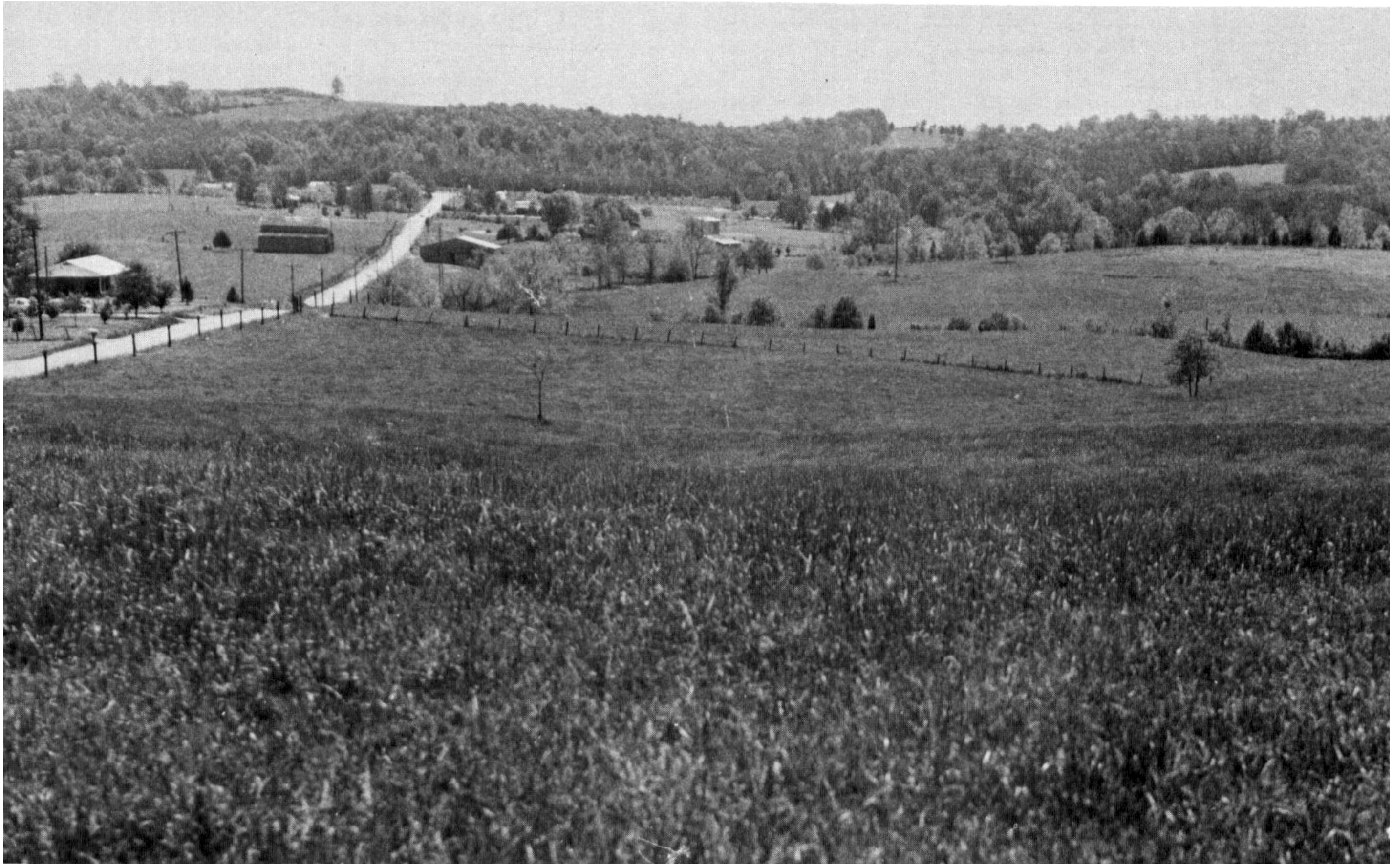


Figure 4.—**Tall fescue on sloping Dewey soils. These soils are excellent for hay and pasture.**

These soils are used largely for hay and pasture. A small acreage is used for corn, small grain, tobacco, and vegetables. The soils are among the best in the county for grasses and legumes.

Representative profile of Dewey silt loam, 2 to 5 percent slopes:

Ap—0 to 6 inches; dark reddish brown (5YR 3/4) silt loam; moderate medium granular structure; friable; medium acid; clear smooth boundary.

B1—6 to 10 inches; dark reddish brown (2.5YR 3/4) silty clay loam; moderate fine subangular blocky structure; friable; many roots; strongly acid; clear smooth boundary.

B21t—10 to 15 inches; dark reddish brown (2.5YR 3/4) clay; moderate fine subangular blocky structure; firm; common roots; thin continuous clay films on faces of peds; strongly acid; gradual smooth boundary.

B22t—15 to 22 inches; dark red (2.5YR 3/6) clay; moderate medium angular blocky structure; firm; common roots; thin continuous clay films on faces of peds; few fragments of chert; strongly acid; gradual smooth boundary.

B23t—22 to 35 inches; red (2.5YR 4/6) clay; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium angular blocky structure; firm, plastic; thin continuous clay films on faces of peds; few fragments of chert; strongly acid; gradual smooth boundary.

B24t—35 to 49 inches; red (2.5YR 4/6) clay; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium angular blocky structure; firm, plastic; thin continuous clay films on faces of peds; 10 percent by volume fragments of chert; strongly acid; gradual smooth boundary.

B3—49 to 72 inches; red (2.5YR 4/6) clay; many medium distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; very firm, plastic; 15 percent by volume fragments of chert; strongly acid.

Depth to bedrock is more than 6 feet. Deep borings in nearby counties indicate that depth to rock is as much as 75 feet in many places. The content of chert or gravel fragments ranges from 0 to 15 percent throughout the soil. The Ap horizon is dark reddish brown and dark brown. In severely eroded areas, it is red or yellowish red silty clay loam or silty clay 4 to 8 inches thick. The B2 horizon is red, dark red, yellowish red, or dark reddish brown in the upper part and red or yellowish red in the lower part. It is clay or silty clay.

DeB—Dewey silt loam, 2 to 5 percent slopes. This soil is in tracts of 3 to 7 acres on broad hilltops. It has the profile described as representative of the series. The surface layer is 4 to 8 inches thick.

Included with this soil in mapping were a few areas where slopes are 5 to 10 percent. Some areas have eroded spots where the surface layer is silty clay loam.

This soil is suited to all crops commonly grown, including corn, tobacco, soybeans, and small grain. The slope and the slight hazard of erosion are the main management concerns in farming. The soil is one of the most desirable in the county for hay and pasture crops, such as alfalfa, orchardgrass, tall fescue, annual lespedeza, white clover, and red clover. Because of the moderate permeability, ponds do not ordinarily hold water well and require chemical treatment for sealing. The potential is high for most urban use. Capability unit IIe-2; woodland group 3o7.

DeC—Dewey silt loam, 5 to 12 percent slopes. This soil is in tracts of 3 to 10 acres, mostly on short hillsides. It is deep and well drained. The surface layer is reddish brown or dark brown and is 4 to 7 inches thick. The subsoil, which is many feet thick, is mainly red, plastic clay. The upper foot or two, however, ranges to dark red or dark reddish brown silty clay loam. Limestone sinks are in a few areas.

Included with this soil in mapping were a few areas where slopes are slightly more than 12 percent or less than 5 percent. Also included were a few severely eroded areas where the surface layer is silty clay loam or clay.

This soil is especially well suited to hay and pasture. Well suited grasses and legumes are alfalfa, orchardgrass, tall fescue, annual lespedeza, sericea lespedeza, white clover, and red clover. Row crops, such as corn, tobacco, soybeans, grain sorghum, and vegetables are fairly well suited. Because of the slope, erosion is a hazard. Permeability is moderate, and ponds generally require chemical treatment for sealing. The potential is high for most urban use. Capability unit IIIe-2; woodland group 3o7.

DeD2—Dewey silt loam, 12 to 20 percent slopes, eroded. This soil is on hillsides in limestone valleys in tracts of 5 to 10 acres. Some areas surround limestone sinks. The surface layer is dark reddish brown or dark brown and is 4 to 7 inches thick. The subsoil is red clay many feet thick.

Included with this soil in mapping were a few areas where slopes are more than 20 percent. Also included were small severely eroded areas where the surface layer is reddish and clayey.

The strong slopes are the main management concern in farming and urban use. Pasture and hay crops are well suited. Erosion is a severe hazard in cultivated areas. No-till rowcropping decreases the hazard of erosion and conserves moisture.

The potential is medium for most urban use. The moderate permeability causes excessive seepage in ponds and lakes, and chemical treatment is generally needed for reservoirs. Capability unit IVe-2; woodland group 3o7.

DgC3—Dewey silty clay loam, 5 to 12 percent slopes, severely eroded. This is a deep, well drained soil on short hillsides in the limestone valley. In most places, the surface layer is former subsoil material. It is reddish brown, dark reddish brown, or red silty clay loam or clay. The subsoil is red clay many feet thick. Some areas surround sinkholes. Included in mapping were a few areas where slopes are less than 5 percent or more than 12 percent.

This soil is best suited to hay and pasture because of poor workability and the hazard of erosion. Tall fescue, orchardgrass, alfalfa, white clover, red clover, and sericea lespedeza are suitable hay and pasture plants. Cultivated crops can be grown occasionally in a long rotation and more frequently in a no-till cropping system.

The potential is high or medium for most urban use. The moderate permeability causes excessive seepage, and chemical treatment is needed for most water impoundments. Capability unit IVe-2; woodland group 4c3e.

DgD3—Dewey silty clay loam, 12 to 20 percent slopes, severely eroded. This soil is on hillsides in tracts of 3 to 10 acres. In some areas it occurs as rims around sinkholes. The surface layer is somewhat clayey because most of the original silt loam surface layer has washed off. It is red and is about 6 inches thick. The subsoil is red clay that is many feet deep over limestone bedrock.

A few tracts where slopes are 20 to 30 percent were included with this soil in mapping. Also included were soils where the surface layer is red clay.

The moderately steep slopes, the medium available water capacity, and the amount of clay in the surface layer are the main management concerns in farming and urban use. The soil is well suited to pasture and hay crops, such as alfalfa, tall fescue, Midland bermudagrass, and sericea lespedeza. In the establishment of new stands, heavy rates of seeding and mulch help to overcome poor germination and high seedling mortality. The potential is medium for most urban use. Capability unit VIe-1; woodland group 4c3e.

Ditney Series

The Ditney series consists of moderately deep, well drained, loamy soils on high mountains. These soils formed in residuum weathered chiefly from arkose sandstone and conglomerate and lesser amounts of phyllite, quartzite, slate, and graywacke. Elevation ranges from about 2,500 to 4,800 feet. Slopes are 12 to 60 percent.

In a representative profile the surface layer is dark grayish brown loam about 2 inches thick. The subsurface layer is yellowish brown loam about 5 inches thick. The subsoil, to a depth of 30 inches, is dark yellowish brown and brown, very friable loam. It is underlain by bedrock. The content of arkosic sandstone fragments ranges from about 15 percent in the upper part of the subsoil to 25 percent in the lower part.

Ditney soils are strongly acid or very strongly acid throughout the profile. Permeability is moderately rapid, and the available water capacity is medium.

Practically all areas of these soils are in forest.

Representative profile of Ditney loam, 12 to 25 percent slopes:

A1—0 to 2 inches; dark grayish brown (10YR 4/2) loam; weak medium granular structure; very friable; many roots; 10 percent by volume fragments of arkosic sandstone as much as 2 inches in size; strongly acid; abrupt smooth boundary.

A2—2 to 7 inches; yellowish brown (10YR 5/4) loam; moderate medium granular structure; very friable; many roots; about 10 percent by volume angular fragments of arkosic sandstone mostly less than 3 inches in size; very strongly acid; clear smooth boundary.

B1—7 to 12 inches; dark yellowish brown (10YR 4/4) loam; weak medium and fine subangular blocky structure; very friable; many roots; about 15 percent by volume angular fragments of arkosic sandstone 1 inch to 5 inches across; very strongly acid; clear wavy boundary.

B2—12 to 25 inches; brown (7.5YR 4/4) loam; weak medium subangular blocky structure; very friable; many roots; about 15 percent by volume angular fragments of arkosic sandstone 1 inch to 8 inches across; very strongly acid; clear wavy boundary.

B3—25 to 30 inches; brown (7.5YR 4/4) cobbly loam; weak coarse subangular blocky structure; very friable; common roots; about 25 percent by volume fragments of arkosic sandstone 1 inch to 10 inches across; very strongly acid.

R—30 inches; arkosic sandstone bedrock; rock has abundant feldspars.

Depth to bedrock ranges from 20 to 40 inches. Fragments of arkosic sandstone make up 10 to 35 percent of the A and B horizons. The A1 horizon is very dark grayish brown or dark grayish brown. The A2 horizon is yellowish brown or brown. The A horizon is loam or, rarely, sandy loam. The B horizon is brown, yellowish brown, strong brown, or dark yellowish brown. The fine earth fraction of the B horizon is loam or sandy loam.

DhD—Ditney loam, 12 to 25 percent slopes. This moderately deep, well drained soil is on mountaintops and upper side slopes. Some sandstone fragments are on the surface and throughout the soil. The soil has the profile described as representative of the series.

Included with this soil in mapping were a few small areas where the lower horizons are more than 35 percent sandstone fragments. Also included were a few areas where the surface layer is silt loam and a few where the subsoil is yellowish red, channery silty clay loam.

Most of the acreage is forest. Suitable trees include Virginia pine, white pine, shortleaf pine, chestnut oak, and scarlet oak. The steep slopes and the depth over rock are the main limitations to use and management. The potential is low for most urban use. Capability unit IVe-1; woodland group 4r3.

DhF—Ditney loam, 25 to 60 percent slopes. This moderately deep, well drained soil is on mountainsides. It is dominantly brown or yellowish brown loam. The content of fragments of sandstone ranges from about 10 to 35 percent, by volume, throughout the soil. These fragments range from less than 1 inch to about 8 inches in size and generally increase in number and size with increasing depth. Depth to arkosic sandstone bedrock ranges from 20 to 40 inches.

Included with this soil in mapping were areas where slopes are less than 25 percent or more than 60 percent. A few tracts have a silt loam surface layer underlain by siltstone or phyllite. Also included were some areas less than 20 inches deep over bedrock that are more than 35 percent, by volume, coarse fragments.

Practically all the acreage is forest, mainly Virginia pine, pitch pine, chestnut oak, and scarlet oak. The soil is well suited to this use. Because of the steep slopes and the moderate depth over rock, the potential is low for farming and urban use. Capability unit VIIe-2; woodland group 4r3.

Dunmore Series

The Dunmore series consists of deep, well drained soils. These soils are on low, rolling to steep hills in the limestone valleys. Sinks and depressions are in many places. The soils formed in material weathered from dolomitic limestone. Slopes are 2 to 35 percent.

In a representative profile the surface layer is brown silt loam about 7 inches thick. The upper 4 inches of the subsoil is strong brown silty clay loam. Below this to a depth of 65 inches is yellowish red, firm clay. Dolomitic limestone bedrock is at a depth of more than 6 feet.

Dunmore soils are easy to work, and except where severely eroded, respond very well to good management. They are strongly acid or very strongly acid throughout the profile. Where limed, the surface layer is less acid. Permeability is moderate, and the available water capacity is medium.

These soils are used for corn, tobacco, small grain, hay, and pasture, but the largest part of the acreage is used for pasture. Some tracts are in small farm woodlots.

Representative profile of Dunmore silt loam, 5 to 12 percent slopes:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; moderate medium granular structure; friable; medium acid; abrupt smooth boundary.

B1—7 to 11 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; strongly acid; clear smooth boundary.

B21t—11 to 36 inches; yellowish red (5YR 5/6) clay; strong medium subangular blocky structure; firm, plastic; thin continuous clay films on faces of peds; strongly acid; gradual smooth boundary.

B22t—36 to 50 inches; yellowish red (5YR 5/8) clay; common medium distinct yellowish brown (10YR 5/6) mottles; strong medium subangular blocky structure; firm, plastic; thin continuous clay films on faces of peds; very strongly acid; gradual smooth boundary.

B23t—50 to 65 inches; yellowish red (5YR 5/8) clay; many medium distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; moderate medium and coarse subangular blocky structure; firm, plastic; thick continuous clay films on faces of peds; very strongly acid.

The Ap horizon is mainly brown or yellowish brown silt loam or loam 5 to 10 inches thick. In severely eroded areas, however, it is strong brown or yellowish red silty clay loam or clay. The B1 horizon is dark yellowish brown, strong brown, or yellowish red silt loam, loam, or silty clay loam 3 to 6 inches thick. It does not occur in some profiles. The B2 horizon is yellowish red or red clay or silty clay. Depth to limestone is more than 6 feet. The content of chert fragments ranges from none to 10 percent, by volume, throughout the soil.

DmB—Dunmore silt loam, 2 to 5 percent slopes. This deep, well drained soil is in tracts of 2 to 5 acres on the tops of low-lying hills (fig. 5). The soil formed in residuum derived from dolomitic limestone. Depth to bedrock is more than 6 feet. Generally, the surface layer is brown silt loam about 5 to 8 inches thick. The subsoil is yellowish red, plastic clay several feet thick.

Included with this soil in mapping were small eroded areas where the surface layer is reddish silty clay loam. Also included were a few areas of a soil that has numerous fragments of chert and a few areas where the surface layer is loam.

This soil is suited to all locally grown crops, including row crops, small grain, hay, and pasture. Erosion is a slight hazard if row crops are grown. Many areas are not large enough for a separate field and are used with adjacent steeper sloping areas. The moderate permeability and underground cavernous rock limit this soil for such uses as pond reservoirs. The potential is

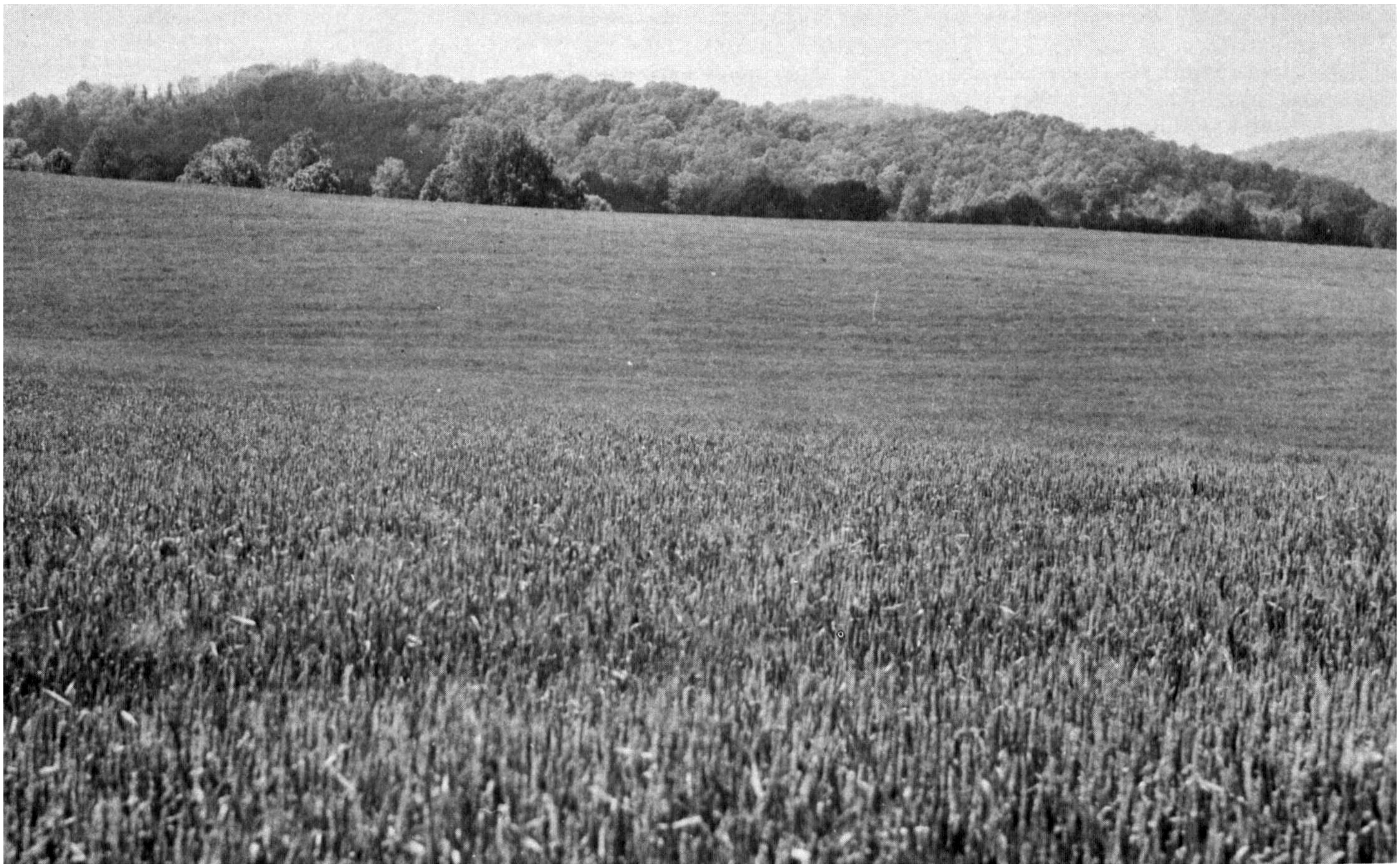


Figure 5.—**Small grain on gently sloping Dunmore silt loam. If well managed, this soil produces excellent yields of small grain, hay, and pasture and most row crops.**

medium for most urban use. Capability unit IIe-2; woodland group 3o7.

DmC—Dunmore silt loam, 5 to 12 percent slopes. This soil is in tracts of 3 to 10 acres on the tops of low-lying hills and on short upland side slopes. Some areas surround shallow depressions and limestone sinks. This soil, which is many feet thick, formed in material weathered from dolomitic limestone. It has the profile described as representative of the series.

Included with this soil in mapping were eroded patches where the surface layer is yellowish or reddish and clayey. These patches give a plowed field a mottled color pattern. A few areas were included where the surface layer is dark brown loam. Also included were small areas in depressions and along drainageways where the soil is dark brown silt loam to a depth of 2 feet or more.

This soil is suited to all crops commonly grown in the county, including corn, burley tobacco, sorghum, soybeans, orchardgrass, tall fescue, annual lespedeza, white clover, and red clover. The slope is the main management concern in row cropped areas. If cultivated, soil-conserving measures are needed that reduce runoff and erosion. The potential is medium for most urban use. Capability unit IIIe-2; woodland group 3o7.

DmD2—Dunmore silt loam, 12 to 20 percent slopes, eroded. This deep, well drained, moderately steep soil is on short upland side slopes. Some areas are deeply pitted by limestone sinks and depressions. The surface layer is brown, and the subsoil is yellowish red, firm and plastic clay. Depth to dolomitic limestone bedrock is more than 6 feet.

Included with this soil in mapping were numerous, small severely eroded areas where the surface layer is reddish silty clay loam or clay and a few small cherty areas. Also included were small areas of a soil in sinks and along narrow, crooked drainageways that are brown silt loam to a depth of 2 feet or more. In a few places, especially along the base of slopes, there are some outcrops of limestone.

The moderately steep slopes are the main concern in use and management. The soil is well suited to small grain, hay, and pasture. Row crops require long rotational cropping systems and other soil-conserving measures, such as no-till cropping to control further erosion. Suitable crops are alfalfa, tall fescue, orchardgrass, annual lespedeza, sericea lespedeza, white clover, and red clover. The potential is medium for most urban use. Capability unit IVe-2; woodland group 3o7.

DmE2—Dunmore silt loam, 20 to 35 percent slopes, eroded. This steep soil is in tracts of 5 to 25 acres on the moderately high hillsides in the limestone valleys.

In some areas it forms rims around limestone sinks. The surface layer is brown and is about 4 to 8 inches thick. The subsoil is yellowish red, firm, plastic clay several feet thick. The lower part of the subsoil is mottled with yellow and brown. Depth to dolomitic limestone rock is more than 6 feet.

Included with this soil in mapping were a few small areas that have numerous chert fragments on the surface and throughout the soil. Also included were a few areas where the surface layer is yellowish silty clay loam and a few hillsides where slopes are more than 35 percent. In a few places, particularly near the base of slopes, there are some outcrops of limestone.

The steep slopes severely limit this soil for farming. The soil is fairly well suited to pasture, but establishment of sod and maintenance is difficult. All climatically suited pasture plants are well suited. The soil is also well suited to trees. Because of the steep slopes, the potential is low for most urban use. Capability unit VIe-1; woodland group 3r8.

DnC3—Dunmore silty clay loam, 5 to 12 percent slopes, severely eroded. This well drained soil is on the tops of low-lying hills and on short upland side slopes. In some places there are limestone sinks and shallow depressions. The surface layer is yellowish red and is 4 to 6 inches thick. The subsoil is yellowish red, firm and plastic clay. Depth to dolomitic limestone bedrock is more than 6 feet.

Included with this soil in mapping were small areas in depressions and along drainageways where the soil is brown or dark brown silt loam to a depth of 2 feet or more. Also included were a few outcrops of rock and a few areas that have numerous fragments of chert throughout.

The surface layer has poor tilth and is somewhat difficult to work into a favorable seedbed. Poor germination and loss of seedlings are likely. The moderately low available water capacity and the slope are main concerns in use and management. The soil is suited to small grain, hay, and pasture. The potential is medium for such urban use as dwellings without basements, septic tank absorption fields, light industry, and roads. Pond reservoirs frequently need chemical treatment to prevent excess seepage. Capability unit IVe-2; woodland group 4c3e.

DnD3—Dunmore silty clay loam, 12 to 20 percent slopes, severely eroded. This deep, well drained soil is on low hillsides in tracts of 2 to about 5 acres. In some places it surrounds limestone sinks. The surface layer is yellowish red and is about 5 inches thick. The subsoil is yellowish red, firm, plastic clay several feet thick. Depth to dolomitic limestone bedrock is more than 6 feet. Gullies, 2 to 3 feet deep and 10 to 40 feet apart, occur in a few areas. Between the gullies the surface layer is silty clay loam or clay. Included in mapping were a few areas that have numerous chert fragments and a few areas that have outcrops of limestone.

This soil is poorly suited to row crops. It is better suited to permanent sod crops, such as tall fescue, white clover, Midland bermudagrass, and sericea lespedeza. The slope and the texture of the surface layer are the main concerns in use and management. Because the moderate permeability and underground cavernous rock cause excessive seepage, chemical treatment is needed in building pond reservoirs. The potential is medium for most urban use, such as septic tank absorption fields, dwellings, and roads. Capability unit VIe-1; woodland group 4c3e.

Dunning Series

The Dunning series consists of dark, poorly drained, nearly level soils. These soils are on bottom land, typically well away from the stream channel and near the base of upland side slopes. Slopes are 0 to 2 percent.

In a representative profile the upper 9 inches of the surface layer is very dark grayish brown, friable silty clay loam. Below this, to a depth of 16 inches, is very dark gray, firm, silty clay loam mottled with gray and reddish brown. The subsoil to a depth of 55 inches is gray, massive, firm silty clay loam and clay mottled with reddish brown, yellowish brown, yellowish red, and olive brown.

Dunning soils are occasionally flooded for very brief periods. They are neutral or slightly acid. The available water capacity is medium, and permeability is slow.

The total acreage of these soils is small and most of it has been cleared. Much of the cleared acreage is in permanent pasture, mainly tall fescue.

Representative profile of Dunning silty clay loam:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silty clay loam; few fine faint gray and reddish brown mottles; moderate fine and medium subangular blocky structure; friable; few mica flakes; slightly acid; gradual smooth boundary.

A1g—9 to 16 inches; very dark gray (10YR 3/1) silty clay loam; common medium distinct gray (10YR 5/1) and reddish brown (5YR 4/4) mottles; moderate fine and medium subangular blocky structure; firm; few mica flakes; slightly acid; abrupt wavy boundary.

B1g—16 to 23 inches; gray (N 5/0) silty clay loam; common medium distinct reddish brown (5YR 4/4) and yellowish brown (10YR 5/4) mottles; massive; firm, plastic; few mica flakes; neutral; gradual smooth boundary.

B2g—23 to 55 inches; gray (N 5/0) clay; common medium distinct yellowish brown (10YR 5/4), yellowish red (5YR 5/6), and light olive brown (2.5Y 5/4) mottles; massive; firm, plastic; neutral.

Depth to bedrock ranges from 4 to 10 feet or more. The A horizon is very dark grayish brown, very dark gray, very dark brown, or black silt loam or silty clay loam. The B horizon is gray or dark gray silty clay loam, silty clay, or clay mottled with yellowish brown, reddish brown, and olive brown.

Du—Dunning silty clay loam. This poorly drained soil is in tracts of 2 to 5 acres on the bottom land. It is away from the stream channel and at the edge of bottoms adjacent to steep uplands. Slopes are 0 to 2 percent. Included in mapping were small areas that are slightly better drained.

This soil is suited to crops that can be planted late, such as soybeans and sorghum, and to plants that tolerate wetness, such as tall fescue. Improved drainage expands the use of the soil to include corn and helps ensure the success of other crops. If suitable outlets are available, a system of open ditches removes surface water and lowers the water table. Suitable row crops can be grown every year because the soil is nearly level and not likely to erode. Harvesting is sometimes difficult because of wetness. The slow permeability favors use of this soil for water impoundments. Because of the wetness, the slow permeability, and the occasional flooding, the potential is low for most urban use. Capability unit IIIw-2; woodland group 2w9.

Emory Series

The Emory series consists of deep, well drained loamy soils along small drainageways and in depressions. These soils formed in sediment washed from reddish soils of the limestone uplands. Slopes are 0 to 3 percent.

In a representative profile the surface layer is dark reddish brown silt loam about 9 inches thick. Below this to a depth of 55 inches is dark reddish brown and reddish brown, friable silt loam.

Emory soils are highly productive and are responsive to good management. They are strongly acid or medium acid. Where limed, the surface layer is less acid. Many low-lying areas are subject to occasional flooding for short periods. Permeability is moderate, and the available water capacity is high.

These soils are used for tobacco, corn, garden crops, hay, and pasture.

Representative profile of Emory silt loam:

Ap—0 to 9 inches; dark reddish brown (5YR 3/3) silt loam; weak fine granular structure; friable; slightly acid; clear smooth boundary.

B1—9 to 20 inches; dark reddish brown (2.5YR 3/4) silt loam; moderate medium granular structure; friable; strongly acid; gradual smooth boundary.

B2—20 to 31 inches; dark reddish brown (5YR 3/4) silt loam; weak fine subangular blocky structure parting to moderate medium granular; friable; strongly acid; gradual smooth boundary.

C—31 to 55 inches; reddish brown (5YR 4/4) silt loam; weak medium granular structure; friable; strongly acid.

The Ap horizon is dark brown or dark reddish brown silt loam or silty clay loam 6 to 14 inches thick. In some profiles, a dark brown buried A horizon is below a depth of 20 to 30 inches. The B horizon is dark reddish brown or reddish brown silt loam or silty clay loam. In some places there are mottles in shades of yellow, brown, and gray below a depth of 25 to 30 inches.

Em—Emory silt loam. This deep, well drained soil is on small benches or foot slopes along small drainageways and in depressions. It is dark reddish brown, friable silt loam to a depth of 3 feet or more.

Included with this soil in mapping were a few small areas of a soil where the surface layer is brown and the subsoil is yellowish red silty clay loam. Also included were a few areas where the surface layer is loam and a few areas of cherty soils.

This is one of the most productive soils in the county. It is well suited to all the locally grown crops. The root zone is deep. The available water capacity is high. The soil is easy to work and crops respond well to management. Generally, flooding is not a hazard in farming. The moderate permeability causes excessive seepage, and water impoundments generally require chemical treatment. Where protection from occasional flooding or standing water is feasible, the potential is high for most urban use. Capability unit I-1; woodland group 2o7.

Etowah Series

The Etowah series consists of deep, well drained, loamy soils on terraces and foot slopes. These soils formed in sediment deposited by streams, as well as sediment that moved downslope. Slopes are 2 to 20 percent.

In a representative profile the surface layer is dark brown, friable silt loam about 7 inches thick. The subsoil to a depth of 60 inches or more is reddish brown and yellowish red, friable silty clay loam. Limestone bedrock is at a depth of 6 feet or more.

Etowah soils are easy to work and are among the most productive in the county. They are strongly acid throughout the profile. Where limed, the surface layer is less acid. Permeability is moderate, and the available water capacity is high.

These soils are used for corn, tobacco, soybeans, small grain, hay, and pasture.

Representative profile of Etowah silt loam, 2 to 5 percent slopes:

Ap—0 to 7 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; very friable; medium acid; abrupt smooth boundary.

B1—7 to 13 inches; reddish brown (5YR 4/4) silty clay loam; weak medium subangular blocky structure; friable; medium acid; gradual smooth boundary.

B21t—13 to 18 inches; reddish brown (5YR 5/4) silty clay loam; moderate medium subangular blocky structure; friable; few thin discontinuous clay films on faces of peds; strongly acid; gradual smooth boundary.

B22t—18 to 23 inches; yellowish red (5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; few thin discontinuous clay films on faces of peds; strongly acid; gradual smooth boundary.

B23t—23 to 60 inches; yellowish red (5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; few thin discontinuous clay films on faces of peds; strongly acid.

The Ap horizon is dark brown or dark reddish brown silt loam or loam 5 to 12 inches thick. The upper 2 feet or more of the B horizon is strong brown, brown, yellowish red, or reddish silty clay loam or clay loam. The lower part is reddish brown, yellowish red, or red silty clay loam, clay loam, or clay. Depth to limestone bedrock is more than 6 feet. The content of waterworn gravel or chert fragments ranges from 0 to about 15 percent, by volume.

EtB—Etowah silt loam, 2 to 5 percent slopes. This deep, well drained soil is on terraces and benches in the upland. It has the profile described as representative of the series. The surface layer is dark brown and is 7 to 12 inches thick, and the subsoil is yellowish red or reddish brown, friable silty clay loam several feet thick.

Included with this soil in mapping were a few small areas where the surface layer is brown cherty or gravelly silt loam and the subsoil is yellowish red cherty or gravelly silty clay loam. Also included were a few areas of brown loamy soils along small drainageways.

This soil is well suited to all crops commonly grown in the county, including corn, alfalfa, burley tobacco, soybeans, white clover, red clover, orchardgrass, tall fescue, sorghum, annual lespedeza, sericea lespedeza, and small grain. The root zone is deep. The available water capacity is high. This soil is highly productive and is easy to work and keep in good tilth, but erosion is a slight hazard. As a result of the moderate permeability, chemical treatment is needed to seal ponds or lakes. The potential is high for most urban use. Capability unit IIe-1; woodland group 2o7.

EtC—Etowah silt loam, 5 to 12 percent slopes. This deep, well drained soil is on terraces high above present streams and on foot slopes in the upland. The surface layer is dark brown, friable, and about 5 to 9 inches thick. The subsoil is reddish brown or yellowish red, friable silty clay loam several feet thick.

Included with this soil in mapping were a few small areas of soils that are 10 to 20 percent, by volume, gravel and a few areas where the surface layer is light brown and the subsoil is yellowish red. Also included were a few strips of brown loamy soils along drainageways.

This soil is well suited to all locally grown crops. Corn, tobacco, alfalfa, annual lespedeza, sericea lespedeza, small grain, tall fescue, orchardgrass, white clover, and red clover are well suited. The hazard of erosion is the main limitation in cultivated areas. The potential is high for most urban use, such as dwellings or roads. Capability unit IIIe-1; woodland group 2o7.

EtD—Etowah silt loam, 12 to 20 percent slopes. This deep, well drained soil is on terraces and benches and foot slopes near the base of higher hills, which are made up of reddish soil developed from limestone. The surface layer is dark brown silt loam about 5 to 8 inches thick. The subsoil is reddish brown or yellowish red, friable silty clay loam several feet thick. Depth to bedrock is more than 6 feet.

Included with this soil in mapping were a few small areas of soils that contain a large volume of chert or gravel. Also included were a few eroded spots where the surface layer is reddish brown silty clay loam.

This soil is suited to all crops commonly grown in the county. The hazard of erosion is severe in cultivated areas. Runoff and soil loss can be reduced by growing row crops in a long rotational cropping system. Other soil-conserving measures, such as no-till cropping, are also needed to control erosion. The soil is best suited to hay and perennial pasture. Alfalfa, orchardgrass, tall fescue, lespedeza, white clover, and red clover are well suited. The potential is medium for most urban use. Capability unit IVe-1; woodland group 2o7.

Farragut Series

The Farragut series consists of deep, well drained soils in shale valleys. These soils formed in old alluvium, 2 to 3 feet thick, and in the underlying residuum weathered from shale. Slopes are about 5 to 20 percent.

In a representative profile the surface layer is dark reddish brown, friable silt loam about 5 inches thick. The subsoil is firm, plastic clay that extends to soft shale at a depth of about 45 inches. It is dark red in the upper part and yellowish red in the lower part. A few chips of soft shale are in the lower part of the subsoil.

Except in severely eroded areas, Farragut soils are easy to work. Where the original surface layer has washed off, the plow layer is clayey and cloddy and is difficult to work. The soils are strongly acid or very strongly acid throughout the profile. Where limed, the surface layer is less acid. Permeability is moderate in the upper 2 feet, but moderately slow below that depth. The available water capacity is medium.

These soils are used mainly for hay and pasture. A few small fields are used for corn, small grain, and tobacco.

Representative profile of Farragut silt loam, 5 to 12 percent slopes, eroded:

Ap—0 to 5 inches; dark reddish brown (5YR 3/3) silt loam; moderate medium granular structure; friable; many roots; medium acid; clear smooth boundary.

B21t—5 to 18 inches; dark red (2.5YR 3/6) clay; moderate medium and fine subangular blocky structure; firm and plastic; common roots; thin discontinuous clay films on faces of peds; strongly acid; clear smooth boundary.

B22t—18 to 25 inches; red (2.5YR 4/6) clay; moderate medium angular blocky structure; firm and plastic; few roots; thin continuous clay films on faces of peds; strongly acid; clear smooth boundary.

B23t—25 to 45 inches; yellowish red (5YR 4/6) silty clay; moderate medium angular blocky structure; firm and plastic; few soft shale chips and few yellowish brown and strong brown mottles which appear to be weathered shale; thin continuous clay films on faces of peds; strongly acid; gradual wavy boundary.

C—45 to 60 inches; soft acid shale containing seams and coatings of silty clay loam mottled in shades of red, yellow, and brown.

Depth to soft shale ranges from about 40 to 65 inches. The Ap horizon is dark reddish brown, dark brown, or dark red silt loam. In severely eroded areas, it ranges to silty clay loam or is finer textured. The upper part of the B horizon is dark red or red clay, silty clay, or silty clay loam. The lower part is yellowish red or red clay, silty clay, or silty clay loam. The lower part is yellowish red or red silty clay that contains few to common soft shale chips.

FaC2—Farragut silt loam, 5 to 12 percent slopes, eroded. This is a deep, well drained soil that has a clayey subsoil. It is underlain by soft shale at a depth of about 3½ to 5 feet. It is in tracts of 3 to 7 acres in the shale valleys. It has the profile described as representative of the series.

Included with this soil in mapping were a few reddish, clayey spots where the original surface layer was removed by erosion. Also included were small areas where slopes are less than 5 percent, a few severely eroded spots where the surface layer is reddish and clayey, and a few areas where shale rock is near the surface.

The slope is the main management concern. All commonly grown plants are suited, but the soil erodes easily if cultivated. Corn, soybeans, burley tobacco, vegetables, small grain, annual lespedeza, orchardgrass, tall fescue, alfalfa, white clover, and red clover are suited. Response to management is limited by the medium available water capacity. The impervious shale rock favors such uses as pond reservoir sites. The potential is low to medium for most urban use. Capability unit IIIe-2; woodland group 3o7.

FgD3—Farragut silty clay, 12 to 20 percent slopes,

severely eroded. This is a deep, well drained clayey soil on short hillsides. It is underlain by soft shale rock at a depth of 3 to 5 feet. The soil is silty clay or clay throughout. It is dark red or red in the upper 12 to 24 inches and yellowish red below that depth. Some shallow gullies occur in a few areas.

Included with this soil in mapping were some less eroded patches, less than ½ acre in size, where the surface layer is silt loam. Also included were a few areas where slopes are more than 20 percent or less than 12 percent.

The clayey surface layer, the medium available water capacity, and the strong slopes are the main limitations in farming. The hazard of further erosion is severe if cultivated crops are grown. The soil is best suited to perennial pasture or trees. Grasses and legumes grow fairly well once seedlings become established. Both pine and hardwood grow on this soil. Virginia pine generally seeds areas that are left idle. The moderately slow permeability favors the soil as sites for water impoundments. The potential is low or medium for most urban use. Capability unit VIe-1; woodland group 4c3e.

Fletcher Series

The Fletcher series consists of moderately deep, well drained, loamy soils. These soils formed in residuum from phyllite on mountaintops and mild side slopes. Elevation is about 1,200 to 2,000 feet. Slopes are 5 to 20 percent.

In a representative profile the surface layer is dark grayish brown silt loam about 1 inch thick. The subsurface layer is brown silt loam about 6 inches thick. The subsoil, to a depth of 32 inches, is yellowish red and strong brown, friable silt loam and silty clay loam. It is underlain by weak red, soft phyllite that crushes to silt loam. Hard phyllite rock is at a depth of 44 inches.

Fletcher soils are strongly acid throughout the profile. The available water capacity is medium, and permeability is moderate.

Much of the acreage has been cleared and is used for row crops, hay, and pasture. Many of the less sloping areas are still used for row crops, mainly corn and vegetables. A few areas are idle, and some have reverted to mixed pine and hardwood forest.

Representative profile of Fletcher silt loam, 12 to 20 percent slopes:

A1—0 to 1 inch; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; very friable; many roots; strongly acid; abrupt smooth boundary.

A2—1 inch to 7 inches; brown (10YR 4/3) silt loam; moderate medium granular structure; friable; many roots; strongly acid; clear smooth boundary.

B1—7 to 11 inches; strong brown (7.5YR 5/6) silt loam; moderate fine and medium subangular blocky structure; friable; common roots; strongly acid; clear smooth boundary.

B21t—11 to 18 inches; yellowish red (5YR 4/6) silt loam; moderate fine and medium subangular blocky structure; friable; common roots; thin discontinuous clay films on faces of peds; strongly acid; clear smooth boundary.

B22t—18 to 32 inches; yellowish red (5YR 4/6) silty clay loam; moderate medium subangular blocky structure; friable; common roots; thin discontinuous clay films on faces of peds; about 5 percent by volume thin fragments of phyllite; strongly acid; clear wavy boundary.

C—32 to 44 inches; weak red (10R 4/3) soft phyllite which crushes easily to silt loam that has a greasy feel; few fragments of moderately hard phyllite rock; strongly acid; clear irregular boundary.

R—44 inches; hard phyllite rock.

Depth to hard bedrock ranges from 3 to about 6 feet. Thin chips of phyllite or siltstone make up 2 to 10 percent of the A and B horizons. In cultivated areas, the A2 or Ap horizon is brown or yellowish brown silt loam 4 to 8 inches thick. The B horizon is strong brown, yellowish red, or red silt loam or silty clay loam. The C horizon is soft red, brown, and gray siltstone or phyllite that crushes easily to silt loam that has a greasy feel. It is in shades of red, brown, and gray.

FhC—Fletcher silt loam, 5 to 12 percent slopes. This is a moderately deep, well drained loamy soil in tracts of 3 to 15 acres on ridgetops and mild slopes in the mountains. It formed from the underlying phyllite rock. Slopes range from 5 to 12 percent, but commonly are not more than 10 percent. The surface layer is brown and is 5 to 10 inches thick. The subsoil is yellowish red, friable silt loam or silty clay loam. Depth to bedrock is 40 to 65 inches.

Included with this soil in mapping were areas where slopes are more than 12 percent or less than 5 percent. Also included were some deep soils along narrow drains and a few tracts where the soil has phyllite chips throughout and is less than 40 inches deep over rock.

Most areas of this soil have been cleared and are used for a variety of crops and pasture, such as corn, tobacco, small grain, orchardgrass, tall fescue, lespedeza, garden vegetables, white clover, and red clover. The slope and the moderate depth are the main limitations. The hazard of erosion is the main limitation if the soil is cultivated. Perennial pasture and hay grow well if adequately fertilized and managed. The potential is high or medium for most urban use. Capability unit IIIe-3; woodland group 2o7.

FhD—Fletcher silt loam, 12 to 20 percent slopes. This moderately deep, well drained loamy soil is on mountainsides. It has the profile described as representative of the series.

Included with this soil in mapping were small areas of Fletcher silt loam where slopes are less than 12 percent or more than 20 percent and some areas where the soil has phyllite chips throughout and is less than 3 feet deep over rock. Also included were narrow strips of deeper, browner soils along narrow drainageways.

The moderately steep slopes and the moderate depth over rock are the main limitations in farming. The moderately steep slopes are suited to perennial pasture and hay crops, such as tall fescue, orchardgrass, sericea lespedeza, Midland bermudagrass, white clover, and red clover. The steeper slopes are best suited to hardwood and pine. The hazard of erosion is severe if the soil is cultivated. The potential is medium for most urban use. Capability unit IVe-1; woodland group 2o7.

Fullerton Series

The Fullerton series consists of deep, well drained, cherty soils on hills and ridges in the western valley part of the county. These soils formed in material weathered from cherty limestone. Slopes are 5 to 40 percent.

In a representative profile the surface layer is brown cherty silt loam about 2 inches thick. The subsurface layer is yellowish brown cherty silt loam about 11 inches thick. The subsoil is yellowish red cherty silty clay loam to a depth of about 23 inches. Below this it is red cherty clay to a depth of 60 inches or more. Limestone bedrock is at a depth of more than 6 feet.

Fullerton soils are strongly acid or very strongly acid throughout the profile. Where limed, the surface layer is less acid. The chert fragments somewhat hinder cultivation with machinery and make the soil slightly droughty. Permeability is moderate, and the available water capacity is medium.

These soils are used for corn, small grain, hay, and pasture, mainly tall fescue and white clover.

Representative profile of Fullerton cherty silt loam, 12 to 20 percent slopes:

A1—0 to 2 inches; brown (10YR 5/3) cherty silt loam; weak fine granular structure; very friable; medium acid; clear smooth boundary.

A2—2 to 7 inches; yellowish brown (10YR 5/4) cherty silt loam; moderate medium granular structure; very friable; strongly acid; clear smooth boundary.

A3—7 to 13 inches; yellowish brown (10YR 5/6) cherty silt loam; moderate medium granular structure; very friable; strongly acid; clear smooth boundary.

B21t—13 to 19 inches; yellowish red (5YR 5/8) cherty silty clay loam; light yellowish brown ped coatings; weak medium subangular blocky structure; friable; 15 percent by volume fragments of chert ½ inch to 2 inches in diameter; thin discontinuous clay films; friable; strongly acid; clear smooth boundary.

B22t—19 to 23 inches; yellowish red (5YR 5/6) cherty silty clay loam; few medium strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; 15 percent by volume fragments of chert ½ inch to 2 inches in diameter; thin discontinuous clay films; strongly acid; clear smooth boundary.

B23t—23 to 60 inches; red (2.5YR 5/8) cherty clay; coatings on yellowish brown (10YR 5/8) peds; moderate medium subangular and angular blocky structure; firm; 20 percent by volume fragments of chert ½ inch to 6 inches in diameter; thin continuous clay films; strongly acid.

In cultivated areas, the Ap horizon is brown or dark grayish brown cherty silt loam or cherty loam about 7 inches thick. In severely eroded places, it is strong brown or yellowish red cherty silty clay loam. The A2 horizon is brown, yellowish brown, or strong brown. The upper part of the B2t horizon is yellowish red, red, or reddish yellow cherty silty clay loam or cherty clay loam. The lower part is red or yellowish red cherty clay. The content of chert fragments is mostly 15 to 25 percent throughout the profile, but ranges from 15 to 35 percent. Depth to bedrock is more than 6 feet.

FtC—Fullerton cherty silt loam, 5 to 12 percent slopes. This deep, well drained soil is on the rounded crests of high ridges that are underlain by dolomitic limestone. It formed in material weathered from similar rock. The surface layer is brown or yellowish brown and is 5 to 10 inches thick. The subsoil is yellowish red cherty silty clay loam in the upper 12 to 24 inches and is red or yellowish red cherty clay below this.

A few areas of soils that have less than 16 percent chert throughout were included with this soil in mapping. Also included were a few spots of Fullerton soils where slopes are more than 12 percent and a few depressional areas less than 1 acre in size that have a fragipan.

Because of the content of chert in the surface layer, the medium available water capacity, and the slope, this soil has medium potential for row crops, such as soybeans, corn, and tobacco. It is better suited to small grain, orchardgrass, tall fescue, lespedeza, and alfalfa. Many isolated areas on hilltops are impractical as separate fields. The potential is high for most urban use. Capability unit IIIe-4; woodland group 3o7.

FtD—Fullerton cherty silt loam, 12 to 20 percent slopes. This deep, well drained soil is on long hillsides, mainly on the south faces of rounded hills and linear ridges underlain by dolomitic limestone. It has the profile described as representative of the series.

Included with this soil in mapping were a few small areas that have very little chert content and a few areas of very cherty soils. Also included were some narrow bands of steeper Fullerton soils that border sinkholes and deep drainageways and some severely eroded areas where the surface layer is yellowish brown or red and clayey.

The steep slopes and the hazard of erosion are the main limitations in cultivated areas. This soil is well suited to all locally grown hay or pasture plants, such as orchardgrass, tall fescue, alfalfa, sericea lespedeza, white clover, and red clover. Response to management is fair. Excessive seepage is a concern for most water impoundments unless treated. The potential is medium for most urban use. Capability unit IVe-3; woodland group 3o7.

FtE—Fullerton cherty silt loam, 20 to 40 percent slopes. This well drained, deep soil is on long, steep hillsides of high linear ridges and rounded hills underlain by dolomitic limestone. The surface layer is brown or yellowish brown and is 5 to 10 inches thick. The subsoil is reddish, cherty silty clay loam that grades to cherty clay at a depth of 2 feet or more. Depth to bedrock is more than 6 feet.

A few areas that have very little chert content were included with this soil in mapping. Also included were a few areas of very cherty soils, a few strips that have scattered bedrock outcrops, and severely eroded patches where the surface layer is yellowish brown or yellowish red silty clay loam.

Because of the steep slopes, this soil is poorly suited to row crops and hay. It is fairly well suited to pasture, mainly tall fescue and white clover. It is suited to trees, and both hardwood and pine make moderate growth. The slope is the main limitation to farming and urban use. Pasture is difficult to seed and maintain because of the difficulty in using machinery. The potential is low for most urban use. Capability unit VIe-1; woodland group 3r8.

Gladeville Series

The Gladeville series consists of well drained, clayey soils on low rolling hillsides. These soils are very shallow over thin-layered limestone.

In a representative profile the surface layer is very dark grayish brown flaggy silty clay loam about 5 inches thick. The underlying material is brown flaggy clay that extends to thin bedded limestone bedrock at a depth of 8 inches.

Gladeville soils are neutral to moderately alkaline. Common fragments of slabby rock and a large amount of clay in the surface layer make cultivation impracticable. Permeability is moderate, and the available water capacity is low.

Most of these soils support scrubby timber, consisting chiefly of eastern redcedar and some hickory. Very little of the acreage has been cleared and much of that is now idle or has reverted to eastern redcedar.

Representative profile of Gladeville flaggy silty clay loam, in an area of Gladeville-Rock outcrop complex, 5 to 25 percent slopes:

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) flaggy silty clay loam; moderate fine and medium granular structure; friable; common fine and coarse roots; limestone fragments less than 4 inches across make up about 40 percent by volume; neutral; clear smooth boundary.

C—5 to 8 inches; brown (10YR 4/3) flaggy clay; weak fine and medium subangular and angular blocky structure; very firm; 40 percent by volume limestone fragments less than 1 inch across; mildly alkaline.

R—8 inches; limestone bedrock.

Depth to bedrock ranges from about 3 to 12 inches. In most places, the dark-colored layer extends to bedrock. Free calcium carbonate is commonly in the lower 1 inch to 4 inches of the profile. The amount of slablike or nodular fragments of limestone ranges from about 35 to 65 percent, by volume. The A horizon is very dark grayish brown, dark brown, or very dark gray. A thin, brown or dark grayish brown C horizon is in some profiles. The texture of the profile is silty clay loam, silty clay, or clay. The upper 2 inches of the A horizon ranges to silt loam.

GdD—Gladeville-Rock outcrop complex, 5 to 25 percent slopes. This mapping unit consists of small areas of Gladeville soil and Rock outcrop that are so intermingled they could not be separated at the scale selected for mapping (fig. 6). It is on low rolling hills. Areas range from about 2 to 5 acres in size.

Gladeville flaggy silty clay loam makes up 45 to 60 percent of the unit. Typically, the soil consists of 5 inches of very dark grayish brown flaggy silty clay

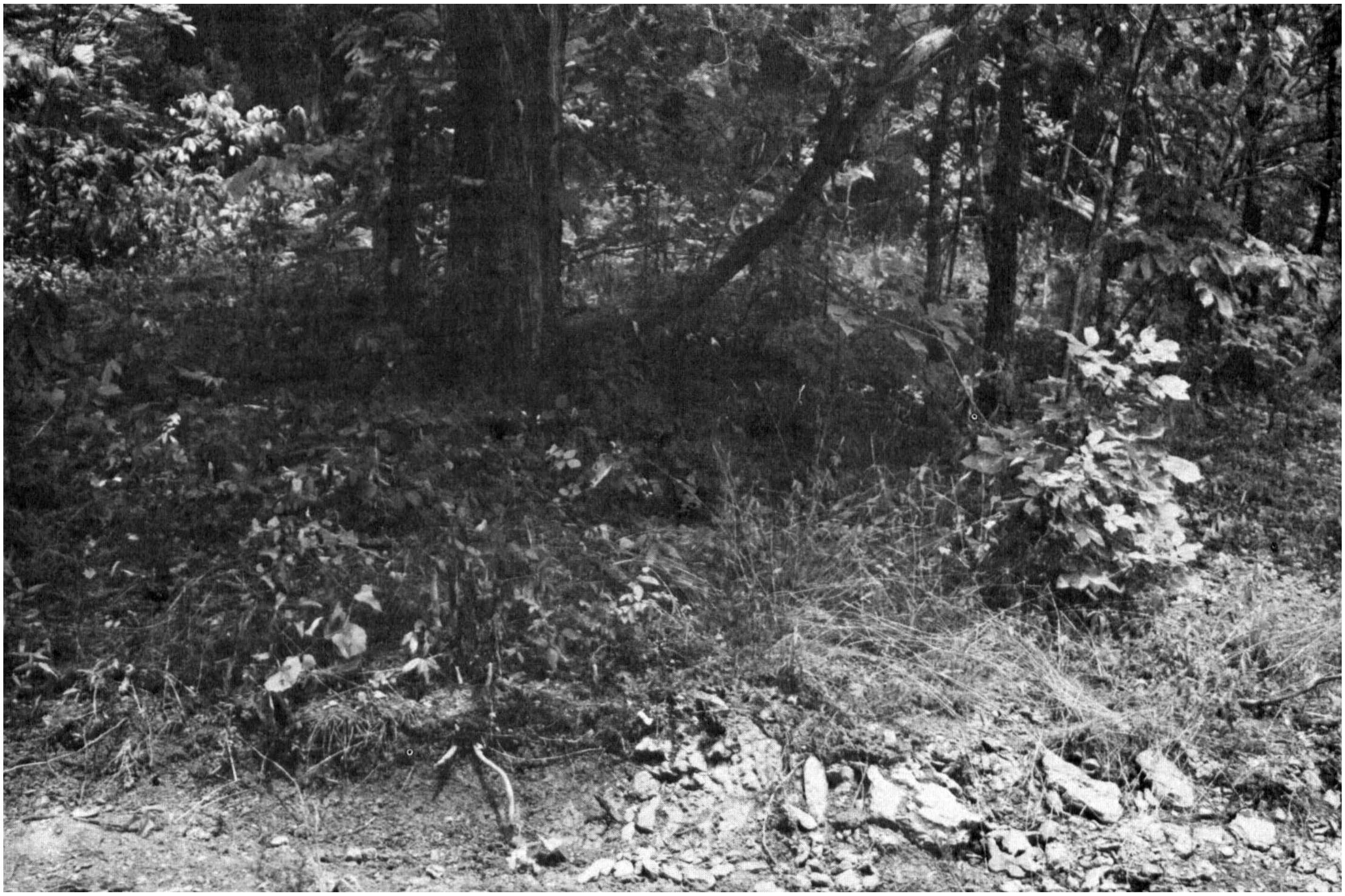


Figure 6.—This Gladeville soil is shallow over layered limestone. Scrubby timber, mostly eastern redcedar and hickory, is dominant.

loam over 3 inches of brown flaggy clay. Limestone bedrock is at a depth of about 8 inches. This soil is neutral to moderately alkaline. The root zone is very shallow. The available water capacity is low, and permeability is moderate.

Rock outcrop of flat limestone makes up 25 to 35 percent of the unit. It extends no more than 1 foot above the surface.

This mapping unit has a low potential for farming and urban use. The shallow depth over bedrock and rockiness are severe limitations that are difficult to overcome for most uses. The potential is low for trees, but the unit is best suited to this use. Eastern redcedar and mixed hickory and oak are dominant. Capability unit VIIs-2; woodland group 5x3.

Greendale Series

The Greendale series consists of deep, loamy, well drained soils. These soils are in long and narrow areas along drainageways and in saucer-shaped depressions. They are near Fullerton and Dunmore soils on uplands. Slopes are 0 to 3 percent.

In a representative profile the surface layer is brown, friable silt loam about 10 inches thick. The subsoil to a depth of 55 inches is yellowish brown, friable silt loam mottled with pale brown below a depth of 22 inches. Limestone bedrock is at a depth of more than 6 feet.

Greendale soils are easy to work and respond extremely well to good management. The soils are rarely subject to flooding. They are strongly acid throughout the profile. Where limed, the surface layer is less acid. Permeability is moderate, and the available water capacity is high.

These soils are used for corn, vegetables, tobacco, hay, and pasture.

Representative profile of Greendale silt loam:

Ap—0 to 10 inches; brown (10YR 5/3) silt loam; weak fine granular structure; very friable; medium acid; clear smooth boundary.

B21—10 to 22 inches; yellowish brown (10YR 5/4) silt loam; moderate medium granular structure; friable; strongly acid; gradual smooth boundary.

B22—22 to 55 inches; yellowish brown (10YR 5/4) silt loam; few fine distinct pale brown (10YR 6/3) mottles; moderate medium granular structure; friable; strongly acid.

The A horizon is brown, yellowish brown, or dark yellowish brown silt loam. The B horizon is yellowish brown, dark yellowish brown, brown, or strong brown silt loam or silty clay loam. The content of chert fragments ranges from about 0 to 15 percent, by volume, in each horizon and normally increases with increasing depth. In some places, gray mottles are below a depth of about 22 inches. Depth to bedrock is more than 6 feet.

Gr—Greendale silt loam. This deep, loamy, well drained soil is in tracts of 2 to 3 acres along drainageways and in saucer-shaped depressions. Slopes are 0 to 3 percent.

Included with this soil in mapping were a few small areas that have a large amount of chert throughout. Also included were some small areas of soils that have gray mottles within 1 foot of the surface and a few spots of a soil that has a fragipan.

This productive soil is suited to all crops commonly grown in the county, including burley tobacco, corn, soybeans, small grain, annual lespedeza, vegetables, and most grasses and legumes. Rare flooding and overwash from adjacent upland slopes occur in some areas. These features have little effect on crops, but they need further investigation before using the soil for building sites. The potential is moderate for most urban use. In areas that do not flood or where the hazard of flooding can be eliminated, the potential is high. Capability unit I-1; woodland group 2o7.

Hamblen Series

The Hamblen series consists of moderately well drained, loamy soils on bottom land. These soils formed in loamy sediment from watersheds dominated by shale, sandstone, and limestone. Slopes range from 0 to 2 percent, but are dominantly less than 1 percent.

In a representative profile the surface layer is brown, friable silt loam about 7 inches thick. The subsoil, to a depth of 29 inches, is brown, friable silt loam mottled in shades of brown and gray. Below this to a depth of 55 inches is light brownish gray and grayish brown, friable silt loam.

Hamblen soils are occasionally flooded during winter and spring. Flooding generally lasts from 1 or 2 hours to about 1 day. These soils are medium acid to neutral. Permeability is moderate, and the available water capacity is high.

These soils are used for corn, hay, and pasture.

Representative profile of Hamblen silt loam:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; weak fine granular structure; friable; many roots; neutral; clear smooth boundary.

B1—7 to 12 inches; brown (10YR 4/3) silt loam; few faint pale brown (10YR 6/3) mottles and few medium distinct reddish brown (5YR 4/4) mottles; weak fine subangular blocky structure parting to weak medium granular structure; friable; many roots; few dark concretions; neutral; clear smooth boundary.

B21—12 to 20 inches; brown (10YR 5/3) silt loam; common medium distinct light brownish gray (10YR 6/2) and reddish brown (5YR 4/4) mottles; weak fine subangular blocky structure; friable; common roots; few fine dark concretions; neutral; clear smooth boundary.

B22—20 to 29 inches; brown (10YR 5/3) silt loam; many medium distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; friable; few roots; common fine dark concretions; neutral; clear smooth boundary.

B3—29 to 41 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct dark brown (7.5YR 4/4) and yellowish brown (10YR 5/4) mottles; weak fine subangular blocky structure; friable; few roots; common fine dark concretions; neutral; clear smooth boundary.

C—41 to 55 inches; grayish brown (10YR 5/2) silt loam; many medium distinct yellowish brown (10YR 5/6) mottles and common medium distinct very dark grayish brown (10YR 3/2) mottles; massive; friable; common fine dark concretions; few roots; neutral.

Depth to bedrock ranges from 3½ to 6 feet or more. Content of coarse fragments is less than 10 percent, by volume. The A horizon is brown or dark grayish brown silt loam, loam, or sandy loam 6 to 10 inches thick. The upper part of the B horizon is brown, yellowish brown, or dark yellowish brown silt loam, loam, clay loam, or silty clay loam. It has few to common mottles in shades of gray, brown, or reddish brown. The lower part of the B horizon and the C horizon are mainly some shade of brown or gray silt loam, silty clay loam, or clay loam. They have common to many brown, gray, yellow, and red mottles or are profusely mottled in shades of those colors.

Ha—Hamblen silt loam. This deep, moderately well drained, loamy soil is in tracts of 2 to 5 acres on bottom land. Slopes are 0 to 2 percent.

Small areas of well drained and somewhat poorly drained soils adjacent to this soil were included in mapping. Also included were spots of a soil that has a sandy subsoil.

A fluctuating water table and occasional, very brief flooding limit this soil for farming and urban use. Crops not likely to be damaged by flooding are very productive. Most crops are well suited, except small grain, alfalfa, and tobacco. Improved drainage helps ensure greater success with other crops. If suitable outlets are available, open ditch or tile drainage, or both, removes surface water and generally lowers the water table. Row crops can be grown every year. Because of wetness and occasional flooding, the potential is low for most urban use. Capability unit IIw-2; woodland group 2w8.

Hartsells Series

The Hartsells series consists of well drained, loamy soils on the broad rolling top of Starr Mountain. Elevation is 1,500 to 2,300 feet. Slopes are 5 to 15 percent.

In a representative profile the surface layer is dark grayish brown fine sandy loam about 2 inches thick. The subsurface layer is brown fine sandy loam about 6 inches thick. The subsoil is yellowish brown and strong brown, friable loam and clay loam that extends to sandstone bedrock at a depth of 33 inches.

Hartsells soils are strongly acid or very strongly acid. Permeability is moderate, and the available water capacity is medium.

Practically all the acreage is forest.

Representative profile of Hartsells fine sandy loam, 5 to 15 percent slopes:

A1—0 to 2 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; few sandstone gravel and an occasional angular sandstone cobble; many roots; strongly acid; abrupt smooth boundary.

A2—2 to 8 inches; brown (10YR 5/3) fine sandy loam; weak fine and medium granular structure; very friable; few small sandstone fragments; many roots; strongly acid; clear smooth boundary.

B1—8 to 16 inches; yellowish brown (10YR 5/4) loam; weak fine and medium subangular blocky structure; friable; few angular sandstone fragments; common roots; strongly acid; clear wavy boundary.

B21t—16 to 27 inches; strong brown (7.5YR 5/8) clay loam; few fine faint strong brown, yellowish brown, and red mottles in lower 5 inches; weak medium subangular blocky structure; friable; few patchy clay films on faces of peds; few angular sandstone fragments; few roots; strongly acid; clear wavy boundary.

B22t—27 to 33 inches; yellowish brown (10YR 5/6) clay loam; common fine faint brown, brownish yellow, and red mottles; weak medium subangular blocky structure; friable; few patchy clay films on faces of peds; few angular sandstone fragments, mainly 1 inch to 6 inches across; few roots; strongly acid.

R—33 inches; acid sandstone bedrock.

Depth to bedrock ranges from 20 to 40 inches. Content of coarse fragments ranges from less than 1 percent to about 15 percent, by volume. The A horizon is dark grayish brown, pale brown, brown, or yellowish brown fine sandy loam or loam 4 to 8 inches thick. The B horizon is yellowish brown, strong brown, or brown sandy loam, loam, clay loam, or sandy clay loam. In some places, there is a sandy loam or gravelly loam C horizon 1 inch to 4 inches thick.

HeC—Hartsells fine sandy loam, 5 to 15 percent slopes. This soil is on the top of Starr Mountain. It is 20 to 40 inches deep over sandstone rock.

Included with this soil in mapping were a few areas of a soil that has numerous fragments of sandstone on the surface and throughout the soil. Also included were patches of a soil less than 20 inches deep over sandstone rock and a few areas where the subsoil is shaly silty clay loam underlain by shale rock.

This soil is somewhat inaccessible, and practically all the acreage is now forest. Because the soil has desirable physical properties, a wide variety of plants respond well to fertilization and other good management. The moderate depth over rock and the gently sloping and moderately steep slopes are the main management concerns in farming. The potential is medium for most urban use. Capability unit IIIe-3; woodland group 4o1.

Holston Series

The Holston series consists of deep, well drained, loamy soils on old stream terraces. These soils formed in old river sediment washed from watersheds dominated by sandstone, shale, siltstone, and limestone rock.

In a representative profile the surface layer is brown loam about 9 inches thick. The subsoil to a depth of 48 inches is yellowish brown and strong brown, friable loam and clay loam. Below this to a depth of 60 inches it is yellowish brown, friable silty clay loam.

Holston soils are easy to work. They have low natural fertility, but respond well to management. They are strongly acid or very strongly acid throughout the profile. Where limed, the surface layer is less acid. The available water capacity is high, and permeability is moderate.

These soils are used for corn, soybeans, small grain, hay, tobacco, and pasture. A few small tracts are still in hardwood timber.

Representative profile of Holston loam, 3 to 12 percent slopes:

Ap—0 to 9 inches; brown (10YR 4/3) loam; weak fine granular structure; very friable; many roots; medium acid; abrupt smooth boundary.

B1—9 to 16 inches; yellowish brown (10YR 5/4) loam; weak medium granular structure; friable; many roots; strongly acid; clear smooth boundary.

B21t—16 to 27 inches; strong brown (7.5YR 5/6) clay loam; weak fine subangular blocky structure; friable; common roots; few thin patchy clay films; strongly acid; gradual smooth boundary.

B22t—27 to 37 inches; yellowish brown (10YR 5/6) clay loam; few fine faint yellow and red mottles; weak fine subangular blocky structure; friable; few roots; few thin patchy clay films; strongly acid; gradual smooth boundary.

B23t—37 to 48 inches; yellowish brown (10YR 5/6) clay loam; common fine and medium strong brown (7.5YR 5/6), pale brown (10YR 6/3), and yellowish red

(5YR 5/6) mottles; weak fine and medium subangular blocky structure; few thin patchy clay films; very strongly acid; clear smooth boundary.

B3—48 to 60 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; very strongly acid.

Depth to rock, most commonly shale, is 5 to 10 feet or more. The A horizon is brown or yellowish brown loam 5 to 12 inches thick. The B horizon is yellowish brown, brown, or strong brown loam or clay loam to a depth of about 4 feet. Below this is silty clay loam, silty clay, or clay. The content of rounded sandstone gravel or cobblestones ranges from 0 to 10 percent, by volume, throughout the soil.

HoC—Holston loam, 3 to 12 percent slopes. This deep, well drained soil is on short side slopes, some of which are banks that lead from the river bottom up to the high terraces.

Included with this soil in mapping were a few areas of a similar soil where slopes are 12 to 20 percent and a few tracts where the soil is mottled silty clay within a depth of 30 inches and is 3 to 5 feet deep over shale bedrock. Also included were some areas that have numerous cobblestones and gravel on the surface and throughout the soil.

This soil has low natural fertility, but crops respond well to management. It is well suited to most crops, such as corn, soybeans, burley tobacco, small grain, annual lespedeza, orchardgrass, tall fescue, and most clovers. The hazard of erosion is the main limitation if the soil is cultivated. The potential is high for most urban use, such as dwellings and septic tank absorption systems. Capability unit IIIe-3; woodland group 3o7.

Jefferson Series

The Jefferson series consists of deep, loamy, well drained soils on benches, fans, and foot slopes. These soils formed in thick deposits of material that rolled from the higher slopes of sandstone and siltstone mountainsides. Slopes are 3 to about 50 percent.

In a representative profile the surface layer is brown fine sandy loam 2 inches thick. The subsurface layer is yellowish brown fine sandy loam 5 inches thick. The subsoil, to a depth of 43 inches, is strong brown loam. The underlying material to a depth of 60 inches is strong brown gravelly sandy loam.

Jefferson soils are naturally low in fertility, but response to liming, fertilization, and other management practices is good. The soils are very strongly acid or strongly acid throughout the profile. Where limed, the surface layer is less acid. Permeability is moderately rapid, and the available water capacity is medium.

Practically all of the acreage is forest. Small, more nearly level areas that are cleared are used for pasture and row crops.

Representative profile of Jefferson fine sandy loam, 12 to 25 percent slopes:

A1—0 to 2 inches; brown (10YR 5/3) fine sandy loam; weak fine granular structure; very friable; many roots; strongly acid; clear smooth boundary.

A2—2 to 7 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; friable; many roots; 10 percent by volume fragments of sandstone less than 1 inch across; strongly acid; clear boundary.

B1—7 to 16 inches; strong brown (7.5YR 5/6) loam; moderate fine subangular blocky structure; friable; common roots; 15 percent by volume fragments of sandstone less than 2 inches across; strongly acid; gradual smooth boundary.

B21t—16 to 25 inches; strong brown (7.5YR 5/6) loam; few medium distinct pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; friable; few roots; few thin patchy clay films on faces of peds; 15 percent by volume fragments of sandstone; strongly acid; gradual smooth boundary.

B22t—25 to 43 inches; strong brown (7.5YR 5/6) loam; common medium distinct pale brown (10YR 6/3) and yellowish red (5YR 5/6) mottles; friable; few roots; many thin patchy clay films on faces of peds; 15 percent by volume fragments of sandstone; strongly acid; clear smooth boundary.

C—43 to 60 inches; strong brown (7.5YR 5/6) gravelly sandy loam; common medium distinct yellowish red and pale brown mottles; 45 percent by volume fragments of sandstone; friable; strongly acid.

The content of coarse fragments, mainly sandstone, is as much as 35 percent, by volume, of each horizon, but ranges to 50 percent in the C horizon. The A1 horizon is brown or dark grayish brown fine sandy loam or loam. The A2 horizon is yellowish brown, dark yellowish brown, or brown fine sandy loam or loam. The B and C horizons are strong brown, yellowish brown, dark yellowish brown, brownish yellow, or, rarely, brown loam, sandy loam, or clay loam or their cobbly or gravelly counterparts. Depth to bedrock is more than 6 feet.

JeC—Jefferson fine sandy loam, 3 to 12 percent slopes. This deep, well drained soil is on benches and fans near the foot of sandstone and siltstone ridges. It formed in material that washed or rolled from the steeper slopes. The surface layer is brown and yellowish brown and is 5 to 10 inches thick. The subsoil is strong brown, friable loam or clay loam a few feet thick and has some angular fragments of sandstone scattered throughout.

Included with this soil in mapping were a few small areas of a brown loamy soil along small, narrow drainageways and a soil that has a fragipan in a few depressional spots. Also included were small areas where the surface layer is cobbly and gravelly and a few areas where slopes are more than 12 percent.

This soil is well suited to all locally grown crops. It is in small tracts and is especially suited to tobacco and home gardens. It responds well to management. Because of the slope, erosion is a moderate hazard if cultivated crops are grown. Hay and pasture crops, such as orchardgrass, tall fescue, annual lespedeza, sericea lespedeza, white clover, and red clover are well suited. The moderately rapid permeability makes chemical treatment necessary to minimize seepage in pond and lake reservoirs. The potential is high for most urban use. Capability unit IIIe-3; woodland group 3o7.

JeD—Jefferson fine sandy loam, 12 to 25 percent slopes. This deep, well drained soil is on foot slopes and in mountain coves. It is mainly in the vicinity of Starr Mountain, but extends intermittently northeast across the county. It has the profile described as representative of the series.

Included with this soil in mapping were small areas where slopes are less than 12 percent or more than 25 percent. Also included were some small areas of soils that are shallower and more sandy.

Very little of this soil has been cleared. The soil is well suited to trees and pasture. A few areas are used for corn, burley tobacco, and home gardens. If the soil is cultivated, the hazard of erosion is severe. The moderately steep slopes are the main management concern for both farming and urban use. The potential is medium for most urban use. Capability unit IVe-1; woodland group 3o7.

JeE—Jefferson fine sandy loam, 25 to 50 percent slopes. This deep, well drained soil is on the lower parts of mountainsides and in coves. The surface layer is dominantly brown and is about 5 to 10 inches thick. The subsoil is yellowish brown or strong brown, friable loam or clay loam. A few small fragments of sandstone are scattered throughout.

Included with this soil in mapping were small areas where slopes are less than 25 percent or more than 50 percent. Also included were some narrow areas of a soil less than 20 inches deep over bedrock that is more sandy and small areas that have numerous sandstone fragments.

Practically all the acreage is forest, and the soil is well suited to this use. Areas that were once cleared have reverted to trees or are idle. The steep slopes are the main management concern. The potential is low for most urban use. Roadbanks are unstable and subject to landslides. Capability unit VIe-1; woodland group 3r8.

JfD—Jefferson cobbly fine sandy loam, 12 to 25 percent slopes. This deep, well drained soil is on foot slopes and benches, mainly in the Starr Mountain area. The surface layer is brown and is 6 to 10 inches thick. The subsoil is strong brown, yellowish brown, or brownish yellow, friable cobbly loam or clay loam. Numerous fragments of sandstone, 1 inch to 10 inches in diameter, are on the surface and throughout the soil.

Included with this soil in mapping were a few areas where slopes are less than 12 percent or more than 25 percent. Some areas contain less than 15 percent cobblestones in the surface layer. Also included were a few small areas of a soil less than 20 inches deep over sandstone rock.

Only a small acreage has been cleared, and most has reverted to woodland. The cleared acreage is used mainly for pasture. Tall fescue, orchardgrass, sericea lespedeza, and white clover are suited. Because of the cobblestones in the surface layer and the moderately steep slopes, this soil is poorly suited to cultivated crops. The potential is medium or low for many urban uses. Capability unit VIs-1; woodland group 3x8.

JfE—Jefferson cobbly fine sandy loam, 25 to 50 percent slopes. This deep, well drained soil is on lower parts of mountainsides and in coves. The surface layer is brown and is 5 to 10 inches thick. The subsoil is strong brown, yellowish brown, or brownish yellow cobbly loam or cobbly clay loam. Numerous cobblestones are on the surface and throughout the soil.

Included with this soil in mapping were a few areas of a soil that has very few cobblestones. Also included were a few narrow ledges of sandstone, a few areas of a soil less than 20 inches deep over bedrock, and a few areas of a soil underlain by shale at a depth of 20 to 30 inches.

The entire acreage is forest, which is the most suitable use. The steep slopes and cobblestones are the main limitations to use and management. The potential is low for most urban use. Road cuts are unstable and landslides commonly occur. Capability unit VIs-1; woodland group 3x8.

Jeffrey Series

The Jeffrey series consists of well drained loamy soils. These soils formed in residuum from arkosic sandstone, graywacke, conglomerate, slate, and phyllite. They are in the high mountains. Elevation is 3,000 to 5,000 feet. Slopes are 12 to 60 percent.

In a representative profile the surface layer is very dark grayish brown and dark brown cobbly loam about 8 inches thick. The subsoil, to a depth of 25 inches, is brown or dark yellowish brown cobbly loam. The underlying material is brown cobbly sandy loam that extends to arkosic sandstone bedrock at a depth of 32 inches.

Jeffrey soils are strongly acid or very strongly acid throughout the profile. Permeability is moderate or moderately rapid, and the available water capacity is medium.

Nearly all the acreage is forest, consisting of yellow-poplar, black cherry, oak, hemlock, buckeye, birch, beech, and white pine. Red spruce and Fraser fir are at the higher elevations.

Representative profile of Jeffrey cobbly loam, 25 to 60 percent slopes:

A11—0 to 3 inches; very dark grayish brown (10YR 3/2) cobbly loam; weak fine and medium granular structure; very friable; many roots; about 20 percent by volume fragments of phyllite and dark sandstone fragments 1 inch to 6 inches in diameter; strongly acid; clear wavy boundary.

A12—3 to 8 inches; dark brown (10YR 3/3) cobbly loam; weak medium granular structure; friable; many roots; about 20 percent by volume fragments of phyllite and sandstone 1 inch to 6 inches in diameter; strongly acid; clear wavy boundary.

B1—8 to 13 inches; brown (10 YR 4/3) cobbly loam; weak medium subangular blocky and medium granular structure; friable; common roots; about 25 percent by volume fragments of phyllite and sandstone 1 inch to 6 inches in diameter; strongly acid; clear wavy boundary.

B2—13 to 25 inches; dark yellowish brown (10YR 4/4) cobbly loam; weak medium subangular blocky structure; friable; common roots; about 30 percent fragments of phyllite and sandstone 1 inch to 6 inches in diameter; strongly acid; clear smooth boundary.

C—25 to 32 inches; brown (10YR 5/3) cobbly sandy loam; structureless; massive; about 35 percent by volume fragments of dark sandstone and slate 1 inch to 5 inches in diameter; strongly acid; clear wavy boundary.

R—32 inches; arkosic sandstone rock.

Depth to bedrock ranges from 20 to 40 inches. The solum ranges from 18 to 30 inches in thickness. The surface area and the solum are 12 to 30 percent coarse fragments of angular stones, cobbles, or pebbles of arkosic sandstone, phyllite, or slate. The C horizon is 15 to 50 percent coarse fragments. The A horizon is very dark grayish brown, dark brown, or very dark brown loam or fine sandy loam 5 to 10 inches thick. The B horizon is brown, dark yellowish brown, or yellowish brown loam or fine sandy loam. The C horizon is similar in color and texture to the B horizon, but commonly has more and larger rock fragments.

JyD—Jeffrey cobbly loam, 12 to 25 percent slopes. This moderately deep, well drained soil is on ridgetops and the upper parts of mountainsides. The surface layer is very dark grayish brown cobbly loam or cobbly fine sandy loam 5 to 10 inches thick. Common gravel and stones of arkosic sandstone, slate, and phyllite are on the surface and throughout the profile.

Included with this soil in mapping were areas where slopes are more than 25 percent and areas that have only a few fragments of rock. Also included were some areas of a soil more than 40 inches deep over bedrock.

Nearly all the acreage is forest. Yellow-poplar, mixed oak, white pine, maple, black cherry, birth, hemlock, and beech are dominant. A very small acreage is used for pasture and wildlife plantings. Because of the slope and the depth over bedrock, the potential is low for farming and many urban uses. Permanent streams, good cover, and ample food supply are conducive to wildlife propagation. The area is suited to hunting, fishing, and other recreational activities. Capability unit IVs-1; woodland group 4x9.

JyF—Jeffrey cobbly loam, 25 to 60 percent slopes. This moderately deep, well drained soil is on mountainsides in the higher sandstone mountain areas. It has the profile described as representative of the series.

Included with this soil in mapping were small areas of a similar soil that is more than 40 inches deep over bedrock. Also included were small areas, mostly on the points of ridges, that are less than 20 inches deep over rock and that have a few rock outcrops.

Practically all the acreage is forest. Oak, yellow-poplar, birch, beech, sugar maple, white pine, and hemlock are dominant. A few cleared areas are used for pasture and wildlife plantings. Because of the steep slopes and depth over bedrock, the potential is low for most uses. Capability unit VIIs-1; woodland group 4x9.

Leadvale Series

The Leadvale series consists of moderately well drained soils that have a fragipan. These soils are on benches, fans, and toe slopes below hillsides underlain by shale. They formed in material that moved downslope from the hillsides. Slopes are 2 to 5 percent.

In a representative profile the surface layer is brown silt loam about 8 inches thick. The subsoil to a depth of 23 inches is yellowish brown, friable silt loam and silty clay loam. A fragipan of firm, brittle silty clay is between depths of 23 and 35 inches. It is mottled in shades of gray and brown. The underlying material to a depth of 55 inches is mottled, firm silty clay that weathered from shale.

Leadvale soils are easy to work and respond fairly well to management, but are slower to dry out in spring than well drained soils. A perched water table is just above the fragipan during periods of high rainfall. The soils are strongly acid or very strongly acid throughout the profile. Where limed, the surface layer is less acid. Permeability is moderately slow, and the available water capacity is medium.

These soils are used for corn, small grain, tobacco, hay, and pasture. A few tracts are in small farm woodlots.

Representative profile of Leadvale silt loam, 2 to 5 percent slopes:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; medium acid; abrupt smooth boundary.

B1—8 to 16 inches; yellowish brown (10YR 5/6) silt loam; weak fine subangular blocky structure; friable; strongly acid; clear smooth boundary.

B2t—16 to 23 inches; yellowish brown (10YR 5/6) silty clay loam; weak fine and medium subangular blocky structure; friable; few fine dark concretions; thin patchy clay films on faces of peds; strongly acid; clear smooth boundary.

Bx1—23 to 27 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct pale brown (10YR 6/3) mottles; weak coarse prismatic structure parting to weak medium platy; compact, brittle; few dark concretions; very strongly acid; gradual smooth boundary.

Bx2—27 to 35 inches; mottled light yellowish brown (10YR 6/4) and light gray (10YR 7/2) silty clay loam; weak coarse prismatic structure parting to weak medium platy; compact, brittle; black concretionary stains; strongly acid; clear smooth boundary.

C—35 to 55 inches; mottled yellowish brown (10YR 5/6), strong brown (7.5YR 5/6), light olive brown (2.5Y 5/6), and light gray (10YR 7/2) silty clay; massive; very firm; strongly acid.

Depth to the fragipan ranges from 20 to 32 inches. Depth to shale bedrock ranges from 40 to 72 inches or more. The A horizon is brown or yellowish brown silt loam 6 to 10 inches thick. The B1 and B2 horizons are yellowish brown or strong brown silt loam or silty clay loam. The Bx horizon is yellowish brown, brownish yellow, strong brown, or light yellowish brown silt loam or silty clay loam. It is mottled in shades of brown and gray. The C horizon is similar in color to the Bx horizon and many profiles are mottled without a dominant color. The C horizon is silty clay loam, silty clay, or clay.

LeB—Leadvale silt loam, 2 to 5 percent slopes. This moderately well drained soil is on terraces, on foot slopes, and at the heads of drainageways below shale hills (fig. 7). It formed in material washed from the adjacent soils of the uplands.

Included with this soil in mapping were small areas of gray, somewhat poorly drained soils in depressional areas. Also included were small areas where slopes are 0 to 2 percent and a few areas where slopes are more than 5 percent.

This soil is fairly well suited to most of the locally grown crops. In periods of extremely high rainfall, crops such as tobacco and alfalfa are damaged because of insufficient aeration of the rooting zone. The potential is low for residential developments that depend upon septic tank disposal systems for sewage treatment. It is medium for most other urban use. Capability unit IIe-6; woodland group 3o7.

Linker Series

The Linker series consists of moderately deep, well drained, loamy soils on mountaintops. Elevation is 1,200 to 2,500 feet. The soils formed in residuum weathered from sandstone. Slopes are 5 to 12 percent.

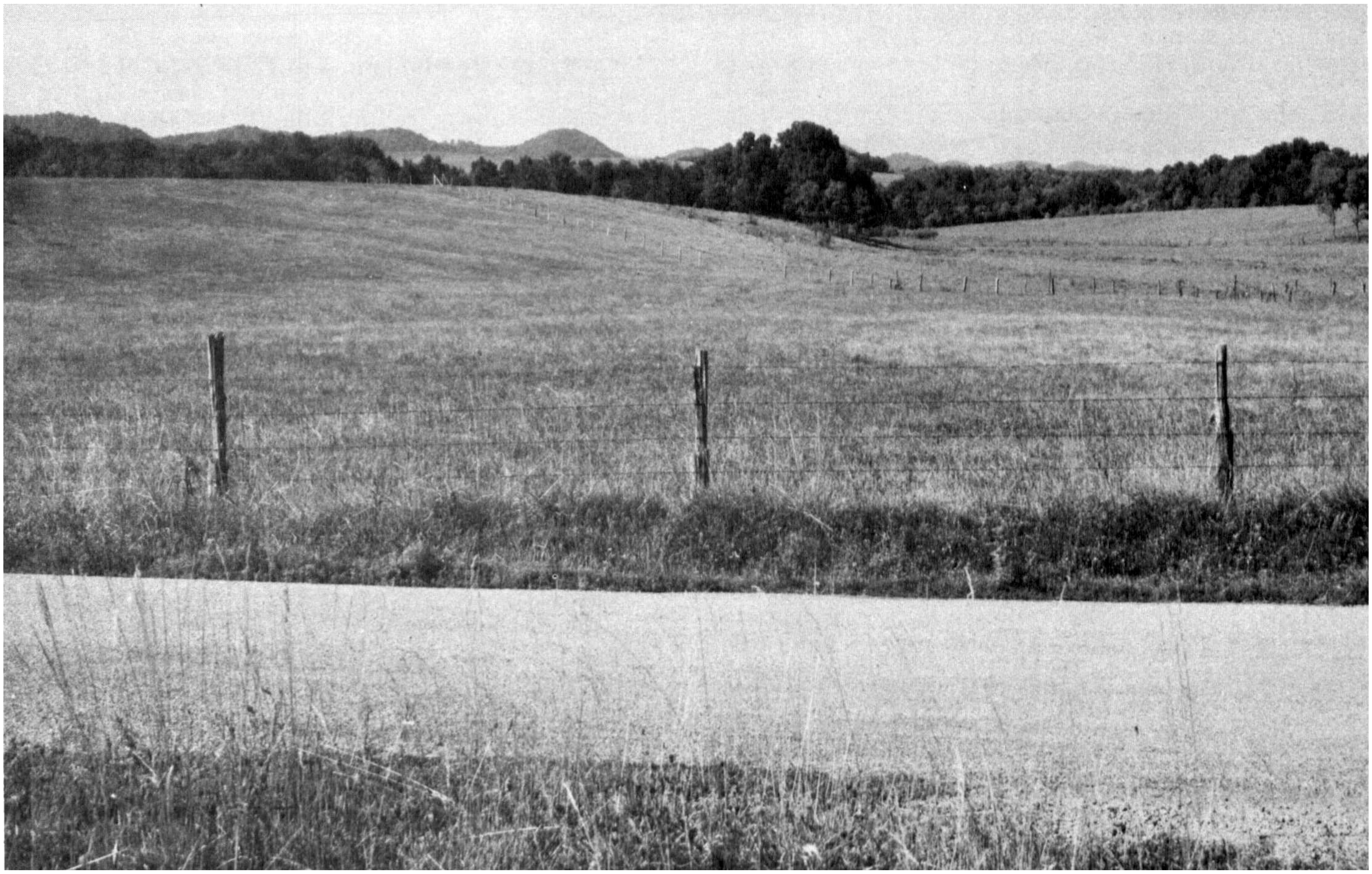


Figure 7.—Leadvale silt loam, 2 to 5 percent slopes.

In a representative profile the surface layer is very dark grayish brown loam about 1 inch thick. The subsurface layer is yellowish brown loam about 5 inches thick. The subsoil is yellowish red. It is friable loam in the upper part, friable clay loam in the next part, and friable gravelly clay loam in the lower part. Hard sandstone bedrock is at a depth of 34 inches.

Linker soils are strongly acid or very strongly acid. Where limed, the surface layer is less acid. Permeability is moderate, and the available water capacity is medium.

Practically all the acreage is forest.

Representative profile of Linker loam, 5 to 12 percent slopes:

A1—0 to 1 inch; very dark grayish brown (10YR 3/2) loam; weak fine granular structure; very friable; many roots; strongly acid; clear smooth boundary.

A2—1 inch to 6 inches; yellowish brown (10YR 5/4) loam; moderate fine and medium granular structure; very friable; many roots; few small pebbles of sandstone and quartzite; strongly acid; clear smooth boundary.

B1—6 to 9 inches; strong brown (7.5YR 5/6) loam; weak fine subangular blocky structure; friable; few small pebbles of sandstone and quartzite; strongly acid; clear wavy boundary.

B21t—9 to 14 inches; yellowish red (5YR 5/8) loam; moderate fine and medium subangular blocky structure; friable; few thin patchy clay films on faces of peds; few small pebbles of sandstone and quartzite; common roots; strongly acid; clear wavy boundary.

B22t—14 to 28 inches; yellowish red (5YR 5/6) clay loam; moderate medium subangular blocky structure; friable; many thin patchy clay films on faces of peds; 5 percent by volume small pebbles of sandstone and quartzite; few roots; strongly acid; clear wavy boundary.

B23t—28 to 34 inches; yellowish red (5YR 5/6) gravelly clay loam; few fine strong brown and yellowish brown mottles; moderate medium subangular blocky structure; friable; few thin patchy clay films on faces of peds; 15 percent by volume fragments of sandstone 1 inch to 6 inches in diameter; few roots; strongly acid.

R—34 inches; hard sandstone.

Bedrock is at a depth of 20 to 40 inches. Coarse fragments of sandstone and quartzite make up to about 15 percent, by volume, of each horizon. The A horizon ranges from 4 to 7 inches in thickness. The A2 horizon is yellowish brown, brown, or grayish brown loam or fine sandy loam. The B2 horizon is yellowish red or red clay loam, loam, or sandy clay loam. In some profiles there is a light clay loam or loam B3 horizon that frequently contains areas or pockets of sandy loam. In a few profiles, there is a C horizon mainly of mottled yellow, brown, and red sandy loam or gravelly sandy loam.

LkC—Linker loam, 5 to 12 percent slopes. This moderately deep, well drained soil is on mountaintops. It has the profile described as representative of the series. Depth to sandstone rock is 20 to 40 inches.

Included with this soil in mapping were a few areas of a soil that is gravelly or cobbly throughout. Bedrock crops out in a few places. Also included were small areas where the subsoil is yellowish and small areas that are underlain by silt loam, silty clay loam, or silty clay at a depth of about 30 inches.

This soil has favorable physical properties for a variety of plants. Crops respond well to lime and fertilizer. Most areas are small and within the boundary of the national forest. Tree growth is fair. The moderate depth over rock and the slope are the main limitations. Because of the depth over bedrock, the potential is low for such uses as septic tank absorption fields, sanitary landfills, and lagoons. It is medium for such uses as roads and light industry. Capability unit IIIe-3; woodland group 4o1.

Litz Series

The Litz series consists of moderately deep, well drained soils that formed in residuum weathered from acid shale. These soils are in areas of highly dissected uplands that are underlain by shale. Slopes are 5 to 35 percent.

In a representative profile the surface layer is yellowish brown shaly silt loam about 8 inches thick. The subsoil to a depth of 22 inches is yellowish brown shaly silt loam. It is about 40 percent fragments of soft shale. The underlying material to a depth of 36 inches is gray, soft acid shale and brownish, yellowish, and reddish soil material that is underlain by rippable acid shale.

Litz soils are strongly acid or very strongly acid. Where limed, the surface layer is less acid. Permeability is moderate, and the available water capacity is low.

These soils are used mostly for pasture and hay. A few areas are idle, and some are in mixed hardwood and pine forest.

Representative profile of Litz shaly silt loam, 5 to 12 percent slopes:

Ap—0 to 8 inches; yellowish brown (10YR 5/4) shaly silt loam; moderate medium granular structure; friable; 25 percent by volume fragments of soft shale; common fine roots; strongly acid; clear smooth boundary.

B—8 to 22 inches; yellowish brown (10YR 5/6) shaly silt loam; few fine distinct yellowish red mottles; moderate medium subangular blocky structure; friable; 40 percent by volume fragments of soft shale; few fine roots; strongly acid; clear irregular boundary.

C—22 to 36 inches; soft acid shale that can be dug with a spade; it is mainly gray and brownish, yellowish, and reddish soft material in cracks and as coating on shale fragments; fines make up about 10 percent of the mass.

R—36 inches; rippable acid shale bedrock.

Depth to rippable shale ranges from 20 to 40 inches. The content of shale fragments ranges from about 10 to 30 percent, by volume, in the A horizon and from 30 to 50 percent in the B horizon. The Ap horizon is yellowish brown or brown silt loam, shaly silt loam, or shaly silty clay loam 4 to 8 inches thick. In unplowed areas, there is a dark grayish brown A1 horizon 1 inch to 2 inches thick. The B horizon is yellowish brown, strong brown, or yellowish red shaly silt loam or shaly silty clay loam. The C horizon is mostly weathered shale in shades of gray and brown. It is soft enough to dig with a spade.

LtC—Litz shaly silt loam, 5 to 12 percent slopes. This moderately deep, well drained soil is in tracts of 5 to 10 acres on the tops of rolling hills. It has the profile described as representative of the series. Rippable shale is between a depth of 20 and 40 inches.

Included with this soil in mapping were areas less than 2 acres in size where the subsoil is yellowish red silty clay. Also included were a few areas of a medium acid to neutral soil that is underlain by calcareous shale.

This soil is best suited to hay, pasture, and trees. Tall fescue, sericea lespedeza, and bermudagrass are suited. The depth to the root zone, the rapid runoff, and the low available water capacity limit the use of this soil for most crops. Because of the depth over shale and the slow downward movement of water, the potential is low for most urban use, such as septic tank filter fields. The impermeable shale favors the soil as sites for reservoirs. Capability unit IVe-4; woodland group 3f8.

LtD—Litz shaly silt loam, 12 to 20 percent slopes. This moderately deep, well drained soil is on short hillsides underlain by shale. The surface layer is yellowish brown, friable, and 4 to 7 inches thick. The subsoil is yellowish brown shaly silt loam or shaly silty clay loam. Soft weathered shale is at a depth of about 20 inches, and depth to rippable shale is about 36 inches.

Included with this soil in mapping were small areas of a soil where the subsoil is reddish and clayey. Also included were areas of a similar soil that is underlain by partly weathered calcareous shale.

This soil is suited to hay, pasture, and trees. The depth over bedrock and the slope are severe limitations in cultivated areas. The underlying shale is nearly impervious, which is an important consideration in selecting sites for pond reservoirs and septic tank absorption fields. Because of this feature, the potential is low for septic tank absorption fields. Capability unit VIe-3; woodland group 3f8.

LtD3—Litz shaly silt loam, 12 to 20 percent slopes, severely eroded. This soil is on hilltops and short hillsides. Numerous fragments of shale are on the surface and throughout the soil. The surface layer is yellowish brown and is 4 to 6 inches thick. The subsoil is yellowish brown shaly silt loam 6 to 10 inches thick. Weathered shale is at a depth of about 12 inches, and shale rock is at a depth of about 24 inches. Included in mapping were some areas that have gullies 2 feet deep and a few areas where shale rock is exposed.

The low available water capacity, the depth over rock, and the moderately steep slopes are the main limitations. The soil is fairly well suited to pasture and trees, but pasture is difficult to establish. The upper part of the shale rock is rippable and deep plowing, or subsoiling, is possible. If left idle, the soil generally seeds to Virginia pine. Although the soil is moderately permeable, the undisturbed shale rock is nearly impervious to water, which is an important feature in engineering uses. The potential is low for septic tank absorption fields, but is favorable for water impoundments. Capability unit VIe-3; woodland group 4c3e.

LtE—Litz shaly silt loam, 20 to 35 percent slopes. This moderately deep, well drained soil is on fairly short hillsides. It formed in material weathered from shale. The surface layer is yellowish brown and is 4 to 6 inches thick. The subsoil is yellowish brown shaly silt loam and extends to a depth of about 20 inches. Below this is soft weathered shale extending to rippable shale at a depth of about 33 inches. Included in mapping were a few small areas where shale bedrock is at the surface and a few areas of a soil where the subsoil is yellowish red silty clay.

The steep slopes, the low available water capacity, and the shale fragments are the main limitations. The soil is fairly well suited to pasture and trees, but pasture is difficult to establish and maintain because overgrazing is common during dry periods. Tall fescue is one of the best suited grasses, and pine and hardwood are suited. Virginia pine seeds naturally. The shale is rippable in the upper part, and deep plowing, or subsoiling, is possible. Water moves through the soil at a favorable rate, but the shale rock is nearly impervious to water. This feature causes high runoff during heavy rain. Because of the steep slopes and the depth over bedrock, the potential is low for urban use, such as dwellings and septic tank absorption fields. Capability unit VIe-3; woodland group 3f8.

LY—Litz and Sequoia soils, gullied. This mapping unit consists of moderately shallow and deep soils on uplands that have many shallow to deep gullies. The soils formed in material weathered from shale. Slopes range from 10 to 35 percent. Some areas contain both Litz and Sequoia soils and some contain only one or the other. Gullies commonly are 1 foot to 3 feet deep and make up about 50 to 70 percent of the unit. Typically, the exposed subsoil is yellowish brown or yellowish red shaly silt loam, shaly silty clay loam, or silty clay. Shale bedrock commonly is exposed at the bottom of gullies.

Litz soils have a silt loam, shaly silt loam, or shaly silty clay loam surface layer 4 to 7 inches thick. Depth to shale bedrock ranges from 20 to 40 inches, but is generally 20 to 30 inches.

Sequoia soils have a silt loam, silty clay loam, silty clay, or shaly silty clay loam surface layer about 4 to 8 inches thick. Depth to soft shale ranges from 20 to 40 inches.

The soils in this unit are strongly acid or very strongly acid throughout the profile. The available water capacity is medium to low, and permeability is slow to moderately slow.

This mapping unit has low potential for farming and most urban use. The depth to shale rock, the hazard of erosion, the lack of available water, the slope, and the slow to moderately slow permeability are the main limitations. Capability unit VIIs-1; woodland group 4c3e.

Lobdell Series

The Lobdell series consists of deep, moderately well drained soils along streams that originate in the mountains. These soils formed in recent loamy sediment derived chiefly from phyllite, siltstone, sandstone, and limestone. Slopes are 0 to 2 percent.

In a representative profile the surface layer is brown, very friable silt loam about 10 inches thick. Brown and dark yellowish brown, friable loam and silt loam faintly mottled in shades of gray and brown is between depths of 10 and 41 inches. Below this, to a depth of 55 inches, is mottled shades of gray and brown gravelly fine sandy loam.

Lobdell soils have good tilth, have moderate to high fertility, and respond well to good management. They are occasionally flooded for brief periods. They are medium acid or slightly acid throughout the profile. Movement of water and air is good. Permeability is moderate, and the available water capacity is high. Runoff is moderately slow.

These soils are used for row crops, hay, and pasture. Most crops are well suited. Alfalfa, tobacco, and small grain, which are the crops affected by wetness and occasional flooding, are not well suited.

Representative profile of Lobdell silt loam:

Ap—0 to 10 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; many roots; slightly acid; clear smooth boundary.

B2—10 to 19 inches; dark yellowish brown (10YR 4/4) silt loam; few fine faint brown mottles; moderate medium granular structure; friable; many roots; slightly acid; clear smooth boundary.

B3—19 to 29 inches; brown (10YR 5/3) silt loam; common medium faint light brownish gray (10YR 6/2) and dark brown (7.5YR 4/4) mottles; moderate medium granular structure; friable; common roots; slightly acid; abrupt smooth boundary.

C1—29 to 41 inches; brown (10YR 5/3) loam; common medium faint light brownish gray (10YR 6/2) and dark brown (7.5YR 4/4) mottles; weak medium granular structure; friable; medium acid; few small pebbles; gradual smooth boundary.

C2—41 to 55 inches; mottled brown (10YR 5/3), light brownish gray (10YR 6/2), and yellowish brown (10YR 5/6) gravelly fine sandy loam; massive; medium acid.

Depth to bedrock is 5 to 12 feet or more. The soil is loam or silt loam and an occasional thin layer of fine sandy loam. The A horizon is brown or dark grayish brown. The B horizon is brown, dark yellowish brown, or yellowish brown mottled in shades of brown and gray. The C horizon is grayish brown or brown mottled in shades of gray, brown, yellow, and red. Round pebbles and other coarse fragments range from 0 to 15 percent, by volume, in each layer.

Lz—Lobdell silt loam. This deep, moderately well drained soil is on the bottoms of streams that originate in the mountains. It formed in recent sediment derived from soils underlain by sandstone, siltstone, phyllite, and limestone. Slopes are 0 to 2 percent.

Included with this soil in mapping were small areas of a soil that is dominantly gray below the surface layer. Also included were small areas of soils that are gravelly throughout.

This soil is well suited to most row crops, hay, and pasture plants, except alfalfa, small grain, and tobacco. A seasonal high water table and occasional flooding are the main management concerns in farming and urban use. A system of open ditches or tile, or both, helps to remove the surface water and lower the water table. Because of the high water table and the occasional brief periods of flooding, the potential is low for most urban use. Capability unit IIw-2; woodland group 2w8.

Minvale Series

The Minvale series consists of deep, well drained, loamy soils. These soils are on foot slopes and benches below Fullerton and Dunmore soils, which are on adjacent hillsides. Slopes are 2 to 12 percent.

In a representative profile the surface layer is brown, friable silt loam about 6 inches thick. The subsoil to a depth of about 43 inches is strong brown or yellowish red, friable silty clay loam. Below this to a depth of about 60 inches or more it is red, friable clay.

Minvale soils are strongly acid or very strongly acid throughout the profile. Where limed, the surface layer is less acid. Crops respond well to management. The available water capacity is high, and permeability is moderate.

These soils are used for a variety of crops and pasture. Very little acreage is in forest.

Representative profile of Minvale silt loam, 2 to 5 percent slopes:

Ap—0 to 6 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; many roots; medium acid; clear smooth boundary.

B1—6 to 11 inches; yellowish brown (10YR 5/6) silt loam and seams of brown (10YR 5/3); weak fine and medium subangular blocky structure; friable; common roots; few small fragments of chert as much as 1 inch across; strongly acid; gradual smooth boundary.

B21t—11 to 20 inches; strong brown (7.5YR 5/6) silty clay loam; moderate fine subangular blocky structure; friable; common roots; few thin discontinuous clay films; few small fragments of chert as much as 1 inch across; strongly acid; clear smooth boundary.

B22t—20 to 32 inches; yellowish red (5YR 5/6) silty clay loam; few fine light yellowish brown mottles; moderate medium subangular blocky structure; friable; common roots; few thin discontinuous clay films; few fragments of chert as much as 1 inch across; strongly acid; gradual smooth boundary.

B23t—32 to 43 inches; yellowish red (5YR 4/6) silty clay loam; few medium yellowish brown (10YR 5/6) and red (2.5YR 5/6) mottles; moderate medium subangular and angular blocky structure; friable; few thin discontinuous clay films; few fragments of chert as much as 1 inch across; strongly acid; gradual smooth boundary.

B3t—43 to 60 inches; red (2.5YR 4/6) clay; few medium distinct light yellowish brown (10YR 6/4) mottles; moderate fine and medium subangular blocky structure; friable; few thin discontinuous clay films; few fragments of chert as much as 1 inch across; strongly acid.

Depth to rock, most commonly limestone, is more than 6 feet. Chert fragments make up about 5 to 15 percent, by volume, of each horizon. The surface layer is yellowish brown, brown, or strong brown silt loam or silty clay loam 6 to 10 inches thick. The B1 horizon is yellowish brown or strong brown silt loam or silty clay loam. The B2 horizon is yellowish red, red, or, rarely, strong brown. The B3 horizon is yellowish red or red silty clay loam or clay. These soils contain fewer coarse fragments than is defined for the series, but this difference does not alter their use and behavior.

MnB—Minvale silt loam, 2 to 5 percent slopes. This deep, well drained soil is in tracts of 2 to 5 acres on foot slopes and benches below hillsides. It has the profile described as representative of the series.

Included with this soil in mapping were small areas that are more than 15 percent, by volume, fragments of chert throughout. Also included were a few small, level or slightly depressed areas where the soil has grayish mottles in the subsoil and a weakly developed fragipan is evident. Some areas are crossed by drainageways, and along these drains are narrow strips of brown silt loam a few feet thick.

This soil is well suited to all crops commonly grown in the county. It responds well to a high level of management. The hazard of erosion is the dominant limitation to farming. The potential is high for most urban use. Capability unit IIe-1; woodland group 3o7.

MnC—Minvale silt loam, 5 to 12 percent slopes. This deep, well drained soil is on foot slopes and benches. Most areas are 2 to 5 acres in size. The surface layer is brown and is 6 to 10 inches thick. The subsoil is strong brown and yellowish red, friable silty clay loam to a depth of about 43 inches and is red clay below that depth. A few chert fragments are on the surface and throughout the soil.

Included with this soil in mapping were spots where the soil is 15 to 20 percent chert fragments. Also included were a few severely eroded areas where the surface layer is reddish silt loam or silty clay loam.

This soil is not difficult to manage. The moderate slopes and the hazard of erosion are the only significant limitations to farming. All commonly grown crops are well suited. The potential is high for most urban use. Capability unit IIIe-1; woodland group 3o7.

Montevallo Series

The Montevallo series consists of shallow, well drained shaly soils. These soils formed in material weathered from acid shale. Slopes are 12 to 30 percent.

In a representative profile the surface layer is dark grayish brown silt loam about 2 inches thick. The subsurface layer is brown shaly silt loam about 4 inches thick. The subsoil to a depth of 17 inches is light yellowish brown shaly silt loam. Shale fragments increase in size and volume with depth. Fractured shale and silt loam in cracks and seams extends to rippable acid shale at a depth of 32 inches.

Montevallo soils are strongly acid or very strongly acid. The available water capacity is low, and permeability is moderate.

Farm use of these soils is limited by the slope, the shallow depth to bedrock, and the low available water capacity. The soils are best suited to trees and most cleared areas have reverted to Virginia pine or mixed hardwoods.

Representative profile of Montevallo shaly silt loam, 12 to 30 percent slopes:

A1—0 to 2 inches; dark grayish brown (10YR 4/2) shaly silt loam; weak fine granular structure; very friable; many roots; 15 percent by volume brown, olive, and red shale fragments about ½ inch long; very strongly acid; abrupt smooth boundary.

A2—2 to 6 inches; brown (10YR 5/3) shaly silt loam;

weak fine granular structure; very friable; many roots 20 percent by volume shale fragments; very strongly acid; clear smooth boundary.

B1—6 to 12 inches; light yellowish brown (10YR 6/4) shaly silt loam; weak fine subangular blocky structure; friable; common roots; 35 percent by volume shale fragments; very strongly acid; abrupt smooth boundary.

B2—12 to 17 inches; light yellowish brown (10YR 6/4) shaly silt loam; weak fine subangular blocky structure; friable; 50 percent by volume shale fragments; common roots along seams and cracks in shale; very strongly acid; gradual irregular boundary.

C—17 to 32 inches; fractured shale that contains light yellowish brown silt loam in seams and cracks; few large roots; very strongly acid; clear irregular boundary.

R—32 inches; rippable acid shale.

Depth to soft shale ranges from 10 to 20 inches. Depth to hard rock is 20 to 36 inches. The A horizon is grayish brown, dark grayish brown, or brown shaly silt loam that is 15 to 35 percent or more, by volume, shale fragments. The B horizon is yellowish brown, light yellowish brown, or strong brown shaly silt loam or shaly silty clay loam that is between 35 and 60 percent, by volume, fragments of shale.

MtE—Montevallo shaly silt loam, 12 to 30 percent slopes. This shallow, well drained soil is on strongly dissected hillsides and on knobby outliers of the mountains.

Included with this soil in mapping were a few areas where shale bedrock is at the surface. Also included were a few areas on narrow ridgecaps where slopes are less than 12 percent.

Because of the slope, the depth over rock, and the low available water capacity, this soil is poorly suited to farming. It is generally best suited to trees. Because of the slope and the depth over bedrock, the potential is low for most urban use. Capability unit VIIs-1; woodland group 4d3.

Neubert Series

The Neubert series consists of deep, well drained, loamy soils. These soils are on narrow bottoms along intermittent streams and on foot slopes. They formed in sediment washed mainly from Tellico and Steekee soils. Slopes are 0 to about 3 percent.

In a representative profile the surface layer is dark reddish brown, friable loam about 7 inches thick. Below this to a depth of more than 63 inches is dark reddish brown, friable loam, silt loam, and fine sandy loam.

Neubert soils are medium acid or slightly acid throughout the profile. Response to management is very good. Overwash of sediment from adjacent slopes is common. These soils are subject to rare, very brief flooding. Permeability is moderate, and the available water capacity is high.

Most areas have been cleared and are used for corn, small grain, tobacco, hay, and pasture. Some small narrow strips are idle or have reverted to forest.

Representative profile of Neubert loam:

Ap—0 to 7 inches; dark reddish brown (2.5YR 3/4) loam; weak medium granular structure; very friable; many roots; few soft reddish sandstone fragments about 1 inch across; slightly acid; clear smooth boundary.

C1—7 to 18 inches; dark reddish brown (2.5YR 3/4) loam; weak medium granular structure or massive; thin dark brown horizontal strata or bedding planes; very friable; common roots; few reddish sandstone fragments less than 2 inches across; slightly acid; gradual smooth boundary.

C2—18 to 28 inches; dark reddish brown (2.5YR 3/4) fine sandy loam; massive; very friable; thin dark brown bedding planes; common roots; few reddish fragments of sandstone 1 inch to 2 inches across; slightly acid; abrupt smooth boundary.

C3—28 to 33 inches; dark reddish brown (2.5YR 3/4) silt loam; massive; friable; few roots; thin dark brown bedding planes; slightly acid; abrupt smooth boundary.

C4—33 to 43 inches; dark reddish brown (2.5YR 3/4) loam; few fine faint dark red and dark brown mottles; massive; faint bedding planes; very friable; few roots; few reddish sandstone fragments as much as 2 inches across; slightly acid; clear smooth boundary.

C5—43 to 63 inches; dark reddish brown (2.5YR 3/4) loam; few medium distinct brown (7.5YR 4/4, 10YR 4/3) and pale brown (10YR 6/3) mottles; massive; friable; few reddish sandstone fragments as much as 2 inches across; slightly acid.

The soil is dark reddish brown, dusky red, and reddish brown loam or fine sandy loam and has a thin subhorizon of silt loam. The content of reddish sandstone or sandy limestone fragments ranges from 1 to 10 percent, by volume. Few to common mottles in shades of brown, red, yellow, and gray are below a depth of 25 to 30 inches in some profiles. Depth to bedrock is more than 6 feet.

Ne—Neubert loam. This deep, well drained soil is along small streams and drainageways. Most areas range from 1 acre to 5 acres in size. Slopes are 0 to about 3 percent.

Included with this soil in mapping were spots of a soil that has a few gray mottles about 20 inches below the surface. Also included were a few small areas that are 15 to 20 percent, by volume, sandy limestone fragments.

Overwash of sediment from adjacent slopes and rare, very brief flooding are the main limitations to use of this soil. Most row crops commonly grown are suited, and tobacco and vegetables are well suited. The soil is nearly level and can be row cropped every year. Many areas are small and odd shaped and are not suitable for use as separate fields. The potential is medium for most urban use. Capability unit I-1; woodland group 2o7.

Newark Series

The Newark series consists of somewhat poorly drained soils. These soils are on flood plains in low areas away from the stream channels. They formed in sediment deposited by rivers and creeks. Slopes are 0 to 2 percent.

In a representative profile the surface layer is brown, friable silt loam about 12 inches thick. The subsoil to a depth of 24 inches is grayish brown mottled silt loam. The underlying material to a depth of 60 inches is grayish brown and gray, friable silt loam mottled in shades of yellow, olive, and brown.

Except in areas where the water table is at or near the surface for long periods in winter and spring, Newark soils have good tilth. The movement of air and water is restricted by the seasonal water table. The soils are medium acid to mildly alkaline throughout the profile. Most areas are occasionally flooded for very brief periods. Permeability is moderate, and the available water capacity is high. Runoff is very slow.

These soils are used for hay, pasture, and to a lesser extent, corn. Most of the larger areas are cleared.

Representative profile of Newark silt loam:

Ap—0 to 12 inches; brown (10YR 5/3) silt loam; few fine faint light brownish gray mottles; moderate fine granular structure; neutral; clear smooth boundary.

B2g—12 to 24 inches; grayish brown (10YR 5/2) silt loam; common fine faint yellowish brown and strong brown mottles; weak medium granular structure; friable; neutral; gradual smooth boundary.

C1g—24 to 31 inches; grayish brown (2.5Y 5/2) silt loam; common medium distinct light olive brown 2.5Y 5/4) mottles; massive; friable; common fine black concretions; clear smooth boundary.

C2g—31 to 60 inches; gray (5Y 5/1) silt loam; light olive brown (2.5Y 5/4) root seams and ped faces; massive; friable; neutral.

The A horizon is dark yellowish brown, brown, or dark grayish brown silt loam. The B horizon commonly is grayish brown or light brownish gray silt loam and has brownish and yellowish mottles. The C horizon ranges from grayish brown to gray silt loam or silty clay loam. Thin subhorizons of loam are in some pedons.

Nk—Newark silt loam. This somewhat poorly drained soil is on flood plains. It is commonly in slightly depressional areas away from the channels. Slopes are 0 to 2 percent. The water table is at or near the surface during most of winter and spring, and the soil is occasionally flooded for very brief periods. Included in mapping were small areas of a grayer and more poorly drained soil and a few spots of a soil that is moderately well drained.

Use of this soil is limited by wetness and occasional flooding. The soil is suited to crops that can be planted late, such as soybeans, and to crops that can tolerate wetness, such as tall fescue. Because the soil is nearly level, erosion is no hazard, even when the soil is row cropped each year. Open ditch or tile drainage broadens the use of the soil and insures greater success of most suited crops. The potential is low for most urban use. Capability unit IIw-3; woodland group 2w8.

Philo Series

The Philo series consists of moderately well drained soils on flood plains. These soils formed in sediment washed mainly from soils underlain by phyllite, slate, sandstone, and shale. Slopes are 0 to 2 percent.

In a representative profile the surface layer is brown, friable silt loam about 10 inches thick. The subsoil to a depth of about 30 inches is yellowish brown, friable silt loam mottled in shades of brown and gray. The underlying material to a depth of about 50 inches is dominantly gray, mottled loam and sandy loam that contains some sandstone gravel.

Philo soils are occasionally flooded, mostly late in winter and early in spring, for very brief periods. They are strongly acid. Where limed, the surface layer is less acid. The available water capacity is high and permeability is moderate.

These soils are used for corn, hay, and pasture. Some very narrow areas along intermittent drains are still in forest.

Representative profile of Philo silt loam:

Ap—0 to 10 inches; brown (10YR 4/3) silt loam; weak and medium granular structure; friable; few small gravel; strongly acid; clear wavy boundary.

B1—10 to 18 inches; yellowish brown (10YR 5/4) silt loam; many brown (10YR 4/3) and few grayish brown (10YR 5/2) mottles; moderate medium granular and weak fine subangular blocky structure; friable; few small gravel; strongly acid; clear wavy boundary.

B2—18 to 30 inches; yellowish brown (10YR 5/4) silt loam; many fine to coarse grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) mottles; weak fine subangular blocky structure; friable; few small gravel; strongly acid; clear wavy boundary.

C1—30 to 38 inches; light brownish gray (2.5Y 6/2) loam; many yellowish brown (10YR 5/6) and brown (7.5YR 4/4) mottles; massive; friable; 10 percent by volume small gravel; strongly acid.

C2—38 to 52 inches; mottled brown, grayish brown, yellowish brown, and light brownish gray gravelly fine sandy loam; massive; very friable; 20 to 30 percent by volume coarse fragments, mainly waterworn gravel; few mica flakes; strongly acid.

The A and B horizons are silt loam and loam that are as much as 15 percent coarse fragments. The fragments, mainly waterworn gravel and channery fragments, make up as much as 40 percent of the C2 horizon. The A horizon is brown or dark grayish brown. The B horizon is brown or yellowish brown. It has few to common mottles in the upper 6 inches. Below a depth of about 24 inches, mottles are common to many. Mica content is generally low, but ranges to medium.

Ph—Philo silt loam. This is a deep, moderately well drained soil in long, narrow-shaped areas along creeks and branches in the mountains. Slopes are 0 to 2 percent.

Included with this soil in mapping were a few spots where the surface layer is sandy loam and gravelly sandy loam. In a few places the soil is gravelly throughout.

Occasional, brief flooding and the high water table during part of winter and spring are the main management concerns. Tobacco, alfalfa, and small grain are not generally suited because of the hazard of flooding. The soil is suited to all plants commonly grown that are not easily damaged by excess water. Because of flooding and wetness, the potential is low for most urban use. Capability unit IIw-2; woodland group 2w8.

Pope Series

The Pope series consists of deep, well drained loamy soils on flood plains and along drainageways on the narrow bottoms in the low mountain area. These soils formed in sediment washed from soils underlain by phyllite and slate. Elevation is 1,000 to 2,000 feet. Slopes are dominantly 0 to 3 percent.

In a representative profile the soil is brown and yellowish brown, friable loam to a depth of about 36 inches. Below this to a depth of 56 inches is yellowish brown, friable fine sandy loam. The profile throughout is about 3 to 15 percent small pebbles.

Pope soils are strongly acid. Where limed, the surface layer is less acid. Occasional flooding occurs in winter and late in spring, but generally lasts only a few hours. Permeability is moderate or moderately rapid, and the available water capacity is high.

Most of the larger areas have been cleared and are used for corn, tobacco, vegetables, hay, and pasture.

Representative profile of Pope loam:

Ap—0 to 8 inches; brown (10YR 4/3) loam; weak fine granular structure; friable; 5 percent by volume small gravel; slightly acid; clear smooth boundary.

B21—8 to 36 inches; yellowish brown (10YR 5/4) loam; weak medium granular structure; friable; 10 percent by volume small gravel; strongly acid; clear wavy boundary.

B22—36 to 46 inches; yellowish brown (10YR 5/4) fine sandy loam; common fine pale brown and light yellowish brown mottles; weak medium granular structure; very friable; 15 percent by volume small gravel; strongly acid; clear wavy boundary.

C—46 to 56 inches; yellowish brown (10YR 5/4) fine sandy loam; many medium pale brown (10YR 6/3) and brown (10YR 4/3) mottles; massive; very friable; 15 percent by volume gravel; strongly acid.

Coarse fragments, mainly waterworn gravel and channery fragments, make up 3 to 15 percent, by volume, of each horizon, but range to as much as 40 percent below a depth of about 40 inches. The Ap horizon is brown, dark grayish brown, dark yellowish brown, or strong brown loam, fine sandy loam, or silt loam.

Po—Pope loam. This is a deep, well drained soil in narrow strips along streams in the mountainous area of the county. Slopes are 0 to 3 percent.

Included with this soil in mapping were a few low-lying areas of a soil that has gray mottles between depths of 12 and 24 inches. Also included were small areas where the surface is 15 percent chert fragments.

This soil is well suited to row crops. Areas are small, but are well suited to tobacco and home gardens. Flooding is the main limitation. Because of flooding, the potential is low for most urban use. Capability unit I-1; woodland group 2o7.

Purdy Series

The Purdy series consists of poorly drained soils on low terraces and in depressions in the uplands. These soils formed in fine-textured alluvium. Slopes are 0 to 2 percent.

In a representative profile the surface layer is grayish brown silt loam about 8 inches thick. The subsoil is light gray and gray, mottled, friable silt loam and silty clay loam to a depth of about 28 inches. Below this to a depth of 50 inches or more it is gray, mottled clay that is firm, sticky, and plastic.

Purdy soils are difficult to work. They can be worked within only a narrow range of moisture content. After a heavy rain, standing water covers most areas for a few hours or a few days. The soils are medium acid to very strongly acid. Where limed, the surface layer is less acid. Permeability is slow, and the available water capacity is medium.

These soils are used mainly for permanent pasture. Some of the acreage is idle.

Representative profile of Purdy silt loam:

Ap—0 to 8 inches; grayish brown (10YR 5/2) silt loam; common medium distinct light gray (10YR 7/1) mottles and few fine prominent dark reddish brown mottles; weak fine granular structure; friable; medium acid; smooth boundary.

B1g—8 to 12 inches; light gray (10YR 7/1) silt loam; few coarse prominent yellowish red (5YR 5/6) mottles; weak medium and fine subangular blocky structure; friable; strongly acid; abrupt wavy boundary.

B21tg—12 to 28 inches; gray (10YR 6/1) silty clay loam; common medium prominent yellowish red (5YR 5/6) and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable; few discontinuous clay films on faces of peds; strongly acid; gradual smooth boundary.

B22tg—28 to 50 inches; gray (10YR 6/1) clay; common medium prominent red (2.5YR 4/8) mottles; weak medium subangular blocky structure; firm, sticky and plastic; many discontinuous clay films on faces of peds; strongly acid.

Depth to bedrock is 4 feet or more. The Ap horizon is grayish brown or dark grayish brown silt loam or silty clay loam 5 to 9 inches thick. The B2g horizon is gray or light gray silty clay loam, silty clay, or clay. It has common to many mottles in shades of yellow, brown, and red.

Pu—Purdy silt loam. This is a deep, poorly drained soil in tracts of 2 to 5 acres on low terraces and in depressions. The surface layer is grayish brown, friable, and about 5 to 9 inches thick. The subsoil is dominantly grayish and is clayey in the lower part. Slopes are 0 to 2 percent.

Included with this soil in mapping were spots of a slightly browner and better drained soil. Also included were areas of a soil that has recent overwash of brown loam 12 to 24 inches thick, and a few areas where the subsoil is light yellowish brown.

Slow permeability and occasional flooding or ponded water limit this soil for farming and urban use. It remains wet much of the fall, winter, and spring. It is suited to water-tolerant perennial grasses, such as tall fescue. Water-tolerant trees grow well. If suitable outlets are available, open ditches help to remove surface water. Tile drains generally do not function well because of the plastic, clayey, slowly permeable subsoil. The slow permeability favors the use of this soil as sites for pond and lake reservoirs. The potential is low for most urban use. Capability unit IVw-1; woodland group 2w9.

Ramsey Series

The Ramsey series consists of somewhat excessively drained, loamy soils that are less than 20 inches deep over sandstone rock. These soils are in mountainous areas. Elevation is 1,000 to 3,000 feet. Slopes are 20 to 70 percent.

In a representative profile the surface layer is dark grayish brown sandy loam about 2 inches thick. The subsurface layer is brown sandy loam 5 inches thick. The subsoil is yellowish brown sandy loam that extends to sandstone bedrock at a depth of 16 inches.

Ramsey soils are strongly acid or very strongly acid. The available water capacity is low, and permeability is rapid.

Most of the acreage is pine and mixed hardwood forest.

Representative profile of Ramsey sandy loam, in an area of Ramsey-Rock outcrop complex, 20 to 70 percent slopes:

A1—0 to 2 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; very friable; 15 per cent by volume coarse sandstone fragments; many roots; strongly acid; clear smooth boundary.

A2—2 to 7 inches; brown (10YR 5/3) sandy loam; weak fine granular structure; very friable; 15 percent by volume fragments of sandstone; many roots; strongly acid; clear smooth boundary.

B—7 to 16 inches; yellowish brown (10YR 5/4) sandy loam; weak or moderate medium granular structure; very friable; 15 percent by volume fragments of sandstone; common roots; strongly acid.

R—16 inches; acid sandstone bedrock.

Depth to sandstone bedrock ranges from 8 to 20 inches. Each horizon is up to 35 percent, by volume, fragments of sandstone or quartzite. The A2 and B horizons are sandy loam or loam. In some profiles, there is a C horizon of yellowish brown loamy sand and many fragments of sandstone.

RaF—Ramsey-Rock outcrop complex, 20 to 70 percent slopes. This mapping unit consists of small areas of Ramsey soils and outcrops of sandstone rock so intermingled they could not be separated at the scale selected for mapping. It is on the upper part of steep, high mountainsides.

Ramsey sandy loam makes up about 60 percent of the unit. Typically, the surface layer is brown sandy loam and the subsoil is yellowish brown sandy loam. Bedrock is at a depth of 16 inches. Permeability is rapid, and the available water capacity is low.

Sandstone rock outcrop makes up about 40 percent of the unit. It extends from about 1 foot to several feet above the surface. In some places it forms an escarpment or free face at the rim of mountaintops.

Included with this unit in mapping were some spots where the soil is less than 8 inches deep over bedrock and others where it is more than 20 inches deep.

This unit has a low potential for farming and urban use. Steep slopes, shallowness over rock, and rock outcrops are difficult limitations to overcome. Capability unit VIIs-1; woodland group 5x3.

Ranger Series

The Ranger series consists of well drained soils that formed in residuum from phyllite. These soils are on mountain ridges and side slopes. Elevation is 1,000 to 3,000 feet. Slopes are 12 to 60 percent.

In a representative profile the surface layer is dark grayish brown channery silt loam about 1 inch thick. The subsurface layer is brown channery silt loam about 5 inches thick. The subsoil is yellowish brown channery silt loam that extends to phyllite bedrock at a depth of 26 inches. It is 40 to 60 percent, by volume, fragments of phyllite.

Ranger soils are strongly acid or very strongly acid throughout the profile. Permeability is moderate, and the available water capacity is low to medium.

The acreage is mainly forest. Cleared areas, particularly on steeper slopes, have reverted to forest. A few small, less steep tracts are in pasture, and a few patches are used for home gardens.

Representative profile of Ranger channery silt loam, 25 to 60 percent slopes:

O2—1 inch to 0; black (10YR 2/1) organic mat of hardwood and pine litter.

A1—0 to 1 inch; dark grayish brown (10YR 4/2) channery silt loam; moderate fine granular structure; very friable; many roots; abrupt smooth boundary.

A2—1 inch to 6 inches; brown (10YR 5/3) channery silt loam; moderate medium granular structure; friable; common roots; 20 percent by volume thin fragments of phyllite as much as 3 inches long; strongly acid; clear wavy boundary.

B2—6 to 18 inches; yellowish brown (10YR 5/4) channery silt loam; weak fine subangular blocky and medium granular structure; friable; common roots; 40 percent by volume thin fragments of phyllite as much as 6 inches long; strongly acid; gradual wavy boundary.

B3—18 to 26 inches; yellowish brown (10YR 5/4) channery silt loam; weak coarse subangular blocky structure; friable; few roots; 60 percent by volume fragments of reddish phyllite as much as 12 inches long and 2 inches thick; some of the fragments are thinly coated on the upper surfaces with clayey and silty soil material; strongly acid; clear irregular boundary.

R—26 inches; hard phyllite rock.

Depth to phyllite, slate, or siltstone ranges from 20 to 40 inches; coarse fragments make up 10 to 35 percent, by volume, of the surface layer and 35 to 60 percent of the subsoil. Fragments range from 1 inch to 12 inches long and from less than 1 inch to about 3 inches thick. The A horizon is brown or yellowish brown channery silt loam 5 to 8 inches thick. The B horizon is yellowish brown, strong brown, or brown channery silt loam or channery silty clay loam. In places, there is a thin argillic horizon of yellowish brown, strong brown, or, rarely, yellowish red channery silty clay loam or channery silt loam.

RgD—Ranger channery silt loam, 12 to 25 percent slopes. This well drained, moderately steep soil is on side slopes in the low mountainous area of the county. The surface layer is brown, friable, and about 5 to 8 inches thick. It is about 20 percent, by volume, phyllite fragments. The subsoil is yellowish brown, brown, or strong brown channery silt loam or channery silty clay loam that is 35 to 60 percent fragments of phyllite. Depth to bedrock ranges from about 20 to 40 inches.

Included with this soil in mapping were some areas where slopes are less than 12 percent or more than 25 percent. Also included were small areas where bedrock is at or near the surface and a few areas of a redder soil that is more than 40 inches deep over bedrock.

This soil is best suited to trees. Because of the slope and the depth over bedrock, the potential is low for farming and most urban use. Capability unit VIe-3; woodland group 3f8.

RgF—Ranger channery silt loam, 25 to 60 percent slopes. This well drained, steep soil is on mountainsides. It has the profile described as representative of the series. The surface layer is brown and is 5 to 8 inches thick. The subsoil is yellowish brown channery silt loam. Depth to bedrock is uneven. It is dominantly 20 to 30 inches, but ranges from 20 to 40 inches.

Narrow ridgecaps of Ranger soil where slopes are less than 25 percent were included with this soil in mapping. Some tracts contain spots of sandy soils underlain by sandstone. Also included were ridge points about 10 to 20 feet wide where phyllite rock is at or near the surface. About 10 to 15 percent of this mapping unit is a deep, brown soil that occurs on the lower parts of slopes and extends up the narrow hollows.

Practically all the acreage is forest, and the soil is best suited to this use. The steep slopes, the moderate depth over rock, and the large amount of phyllite fragments in the soil are the main limitations. The steep slopes severely limit this soil for farming and urban use. Capability unit VIIe-2; woodland group 3f9.

Sequatchie Series

The Sequatchie series consists of deep, well drained soils on low terraces. These soils formed in sediment washed from uplands underlain by sandstone and shale. Slopes are 0 to 2 percent.

In a representative profile the surface layer is dark brown, friable loam about 9 inches thick. Below this to a depth of 55 inches is dark brown and strong brown, friable loam. Below a depth of about 18 inches, the content of gravel is 10 to 15 percent.

Sequatchie soils are strongly acid or very strongly acid. Where limed, the surface layer is less acid. The response to good management is excellent. Permeability is moderate, and the available water capacity is high.

These soils are used for a wide variety of row crops, hay, and vegetables.

Representative profile of Sequatchie loam:

Ap—0 to 9 inches; dark brown (10YR 3/3) loam; weak fine granular structure; very friable; many roots; medium acid; abrupt smooth boundary.

B1—9 to 13 inches; strong brown (7.5YR 5/6) loam; weak fine subangular blocky structure; friable; strongly acid; gradual smooth boundary.

B21t—13 to 18 inches; dark brown (7.5YR 4/4) loam; moderate fine and medium subangular blocky structure; friable; thin discontinuous clay films on faces of peds; clear wavy boundary.

B22t—18 to 34 inches; dark brown (7.5YR 4/4) loam; weak medium subangular blocky structure; friable; thin discontinuous clay films on faces of peds; 10 percent by volume gravel; strongly acid; clear smooth boundary.

B3—34 to 55 inches; dark brown (7.5YR 4/4) loam; common medium distinct pale brown (10YR 6/3) mottles; weak fine subangular blocky structure; friable; 15 percent by volume gravel; strongly acid.

Depth to bedrock is 5 feet or more. The A horizon is dark brown or dark yellowish brown fine sandy loam, loam, or, rarely, silt loam 5 to 12 inches thick. The B horizon is dark brown, strong brown, yellowish brown, or dark yellowish brown loam, silt loam, or clay loam. The C horizon is brown or yellowish brown loam, sandy loam, or loamy sand mottled in shades of gray, brown, or yellow. Content of gravel and other coarse fragments ranges from 0 to 15 percent in the solum, but is as much as 30 percent in the C horizon in some profiles.

Sa—Sequatchie loam. This deep, well drained soil is on low terraces. Slopes are 0 to 2 percent.

Included with this soil in mapping were small areas of a soil that has gray mottles at a depth of about 20 inches. Also included were spots where the profile is more than 15 percent gravel or coarse fragments and small areas where slopes are more than 2 percent.

This soil is well suited to all crops commonly grown, such as corn, soybeans, burley tobacco, and small grain. It responds well to good management. Erosion is not a serious hazard and row crops can be grown every year. Rare flooding in some areas is a slight limitation to some farming uses. This same limitation causes a moderate potential for most urban use. The hazard of flooding must be determined for each area. Capability unit I-1; woodland group 2o7.

Sequoia Series

The Sequoia series consists of moderately deep, well drained soils that have a clayey subsoil. These soils formed in material weathered from acid shale. They are on low rolling hills. Slopes are 2 to 20 percent.

In a representative profile the surface layer is brown silt loam about 6 inches thick. The subsoil to a depth of about 34 inches is yellowish red, firm silty clay. Below this is rippable, acid shale rock that contains thin seams and coatings of soil material in the upper 12 to 24 inches.

Except in severely eroded areas, Sequoia soils have good tilth. They are strongly acid or very strongly acid throughout the profile. Where limed, the surface layer is less acid. Permeability is moderately slow, and the available water capacity is medium to low depending on the depth to rock. Runoff is medium to rapid.

These soils are used mainly for pasture and hay. Small patches of corn, small grain, and tobacco are also grown. A few areas are in small farm woodlots.

Representative profile of Sequoia silt loam, 2 to 5 percent slopes:

Ap—0 to 6 inches; brown (10YR 4/3) silt loam; weak medium granular structure; friable; many roots; strongly acid; abrupt smooth boundary.

B1—6 to 9 inches; strong brown (7.5YR 5/6) silty clay loam; moderate fine subangular blocky structure; firm; common roots; strongly acid; clear smooth boundary.

B21t—9 to 19 inches; yellowish red (5YR 5/6) silty clay; strong fine and medium subangular and angular blocky structure; firm; thin continuous clay films on faces of peds; few roots; strongly acid; gradual smooth boundary.

B22t—19 to 28 inches; yellowish red (5YR 5/6) silty clay; common yellowish brown (10YR 5/6) mottles; strong fine and medium angular blocky structure; firm; 5 percent by volume small weathered shale fragments; thin continuous clay films on faces of peds; few roots; strongly acid; gradual smooth boundary.

B3—28 to 34 inches; yellowish red (5YR 5/6) silty clay; common yellowish brown (10YR 5/6) mottles; moderate fine and medium angular blocky structure; firm; 15 percent by volume small weathered shale fragments; strongly acid; gradual smooth boundary.

C—34 to 50 inches; soft tilted olive and yellow acid shale; few thin seams of soil material in cracks and coating shale fragments.

Thickness of the solum and depth to soft shale range from 20 to 40 inches. Depth to hard shale is 5 feet or more. The Ap horizon is mainly brown, strong brown, or dark grayish brown silt loam 4 to 8 inches thick. In severely eroded areas it is strong brown or yellowish red silty clay loam or silty clay. The B horizon most commonly is yellowish red, but it ranges to strong brown, especially in the upper and lower parts. It is silty clay or clay except for thin subhorizons of silty clay loam.

SeB—Sequoia silt loam, 2 to 5 percent slopes. This moderately deep, well drained soil is in tracts of 2 to 5 acres, mostly on the tops of low hills. It has the profile described as representative of the series.

Included with this soil in mapping along drainageways were small areas of a brownish, mottled soil that is silt loam to a depth of 2 feet or more. Also included were spots where the surface layer is reddish silty clay loam or silty clay.

This soil is moderately well suited to a variety of row crops, such as corn, small grain, soybeans, grain sorghum, and burley tobacco. It is well suited to sericea lespedeza, annual lespedeza, orchardgrass, tall fescue, white clover, red clover, and other pasture and hay crops. The available water capacity is medium. The root zone is moderately deep. In cultivated areas, erosion is a hazard and soil-conserving measures are needed.

Moderately slow permeability and the impermeable underlying shale bedrock favor the soil as sites for water impoundments. These same features, however, cause a low potential for septic tank absorption fields. The soil has a medium potential as sites for dwellings without basements. Capability unit IIIe-5; woodland group 3o7.

SeC2—Sequoia silt loam, 5 to 12 percent slopes, eroded. This moderately deep, well drained soil is on low-lying hillsides. It is underlain by acid shale. The surface layer is brown and is 4 to 7 inches thick. The subsoil is yellowish red, firm silty clay. Depth to soft rippable shales ranges from 20 to 40 inches.

Included with this soil in mapping were severely eroded spots where the surface layer is reddish silty clay loam or silty clay. Also included were a few small areas of a soil that has shale rock between depths of 10 and 20 inches and small areas where the depth to soft shale is more than 40 inches.

This soil is fairly well suited to locally grown crops. The slope, the limited effective rooting depth, the moderately slow permeability, and the medium available water capacity are important considerations in managing this soil for crops and pasture. Response is moderate to good management. Runoff and the hazard of further erosion make this soil best suited to hay and pasture. Tall fescue, orchardgrass, annual lespedeza, sericea lespedeza, white clover, and red clover are suited.

Because of the moderately slow permeability and impermeable underlying shale bedrock, the potential of this soil is high as sites for ponds and lakes, but low for septic tank absorption systems. The potential is medium for dwellings without basements. Capability unit IVe-5; woodland group 3o7.

SeD2—Sequoia silt loam, 12 to 20 percent slopes, eroded. This moderately deep, well drained, moderately steep soil is on hillsides. It formed in material weathered from acid shale. The surface layer is brown and is 4 to 7 inches thick. The subsoil is yellowish red silty clay and is underlain by soft weathered shale at a depth of 20 to 40 inches.

Included with this soil in mapping were a few small areas of a soil that is less than 20 inches deep over rock and contains many fragments of shale. Also included were many small severely eroded areas where the surface layer is reddish and clayey.

This soil is fairly well suited to pasture, hay, and small grain. It has moderately steep slopes, rapid runoff, moderate depth to impervious shale, and moderately slow permeability. The hazard of further erosion is severe for row crops. The potential is low for most urban use, but it is medium for dwellings without basements. Capability unit VIe-2; woodland group 3o7.

SgC3—Sequoia silty clay, 5 to 12 percent slopes, severely eroded. This is a well drained, moderately deep soil on the tops and sides of low-lying hills. It is underlain by acid shale. The surface layer is yellowish red, firm silty clay 4 to 7 inches thick. The subsoil is yellowish red, firm silty clay. Soft rippable shale is between depths of 20 and 40 inches.

Included with this soil in mapping were small areas of a soil that is less than 20 inches deep over soft shale and contains many shale fragments. Also included were small areas where the depth to soft shale ranges from 40 to 60 inches.

This soil is fairly well suited to pasture, small grain, and hay. The hazard of further erosion is severe for row crops. Grasses and legumes are difficult to establish because of the clayey surface layer and the resulting low available water capacity and poor workability. As a result of the moderately slow permeability, moderate depth to impervious shale, and clayey texture, the potential is low for septic tank absorption fields. It is medium for dwellings without basements. Capability unit VIe-2; woodland group 4c3e.

SgD3—Sequoia silty clay, 12 to 20 percent slopes, severely eroded. This clayey, moderately deep soil is on hillsides. It formed in material weathered from shale. The surface layer is yellowish red and is 5 to 7 inches thick. The subsoil is yellowish red silty clay. Soft shale is at a depth of 20 to 40 inches.

A few small gullied areas were included with this soil in mapping. Also included were patches of shallow shaly soils less than 20 inches deep over rock.

This soil is only fair for pasture and hay. Tall fescue, sericea lespedeza, and bermudagrass are best suited. The clayey surface layer makes the soil difficult to work and causes a high seedling mortality. The moderately steep slopes, rapid runoff, moderately slow permeability, and low available water capacity are management concerns in farming. The potential is low for most urban use, but it is medium for dwellings without basements. Capability unit VIe-2; woodland group 4c3e.

Shelocta Series

The Shelocta series consists of deep, well drained soils on foot slopes and benches of mountains. These soils formed in sediment derived chiefly from shale, siltstone, and phyllite rock. Slopes are 3 to 25 percent.

In a representative profile the surface layer is brown silt loam about 8 inches thick. The subsoil, to a depth of 35 inches, is yellowish brown, friable silt loam and silty clay loam. Between depths of 35 and 48 inches, it is strong brown silty clay loam. Below this, to a depth of 60 inches, it is light yellowish brown silt loam that is faintly mottled with yellowish brown.

Shelocta soils are strongly acid or very strongly acid. Where limed, the surface layer is less acid. Permeability is moderate, and the available water capacity is high.

Most areas are forest. Only the more nearly level areas are cleared. They are used for pasture and small patches of corn and garden crops.

Representative profile of Shelocta silt loam, 3 to 12 percent slopes:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; moderate fine and medium granular structure; friable; few shale or siltstone chips less than 1 inch across; many small roots; medium acid; abrupt smooth boundary.

B1—8 to 18 inches; yellowish brown (10YR 5/4) silt loam; weak fine subangular blocky structure; friable; few small shale or siltstone fragments; common roots; strongly acid; clear smooth boundary.

B21t—18 to 35 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; few thin discontinuous clay films on faces of peds; few shale or siltstone fragments and quartzite gravel; few roots; strongly acid; clear wavy boundary.

B22t—35 to 48 inches; strong brown (7.5YR 5/8) silty clay loam; common fine and medium distinct brownish yellow (10YR 5/6) and red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; friable; common thin discontinuous clay films on faces of peds; few small shale or siltstone and quartzite fragments; strongly acid; clear wavy boundary.

B3—48 to 60 inches; light yellowish brown (10YR 6/4) silt loam; common fine and medium faint yellowish (10YR 5/6) mottles; moderate medium and coarse subangular blocky structure; friable; about 10 percent by volume fragments of shale and siltstone; strongly acid.

Depth to bedrock is more than 4 feet. The content of coarse sandstone and siltstone fragments ranges from 8 to 20 percent in the surface layer, from 8 to 30 percent in the upper part of the subsoil, and from 10 to 35 percent in the lower part. The A horizon is brown or yellowish brown silt loam or loam. The B horizon is mainly yellowish brown or strong brown, but is also brownish yellow, reddish yellow, and light yellowish brown silt loam, clay loam, or silty clay loam. In some profiles the C horizon is yellowish brown, light yellowish brown, brownish yellow, or olive brown silt loam or loam that contains few to many shale, siltstone, or phyllite fragments.

ShC—Shelocta silt loam, 3 to 12 percent slopes. This deep, well drained soil is in tracts of 5 to 15 acres on benches and foot slopes. It has the profile described as representative of the series.

Included with this soil in mapping were areas that are more than 15 percent shale or siltstone fragments. Also included were areas of Shelocta silt loam where slopes are less than 3 percent or more than 12 percent.

The acreage is mainly woodland. Cleared areas are used for row crops, hay, and pasture. Most crops are suited, including corn, soybeans, burley tobacco, and small grain. The slope is the only significant limitation to both farming and urban use. The hazard of erosion is the main limitation in cultivated areas. The potential is high for most urban use. Capability unit IIIe-1; woodland group 3o7.

ShD—Shelocta silt loam, 12 to 25 percent slopes. This deep, well drained soil is on moderately steep foot slopes. The surface layer is brown or yellowish brown and is friable. The upper part of the subsoil is yellowish brown or strong brown, friable silt loam or silty clay loam. The lower part is light yellowish brown or brownish yellow and has few mottles in shades of brown and red.

Included with this soil in mapping were small areas of a soil that is gravelly or cobbly throughout. Also included were areas where slopes are less than 12 percent or more than 25 percent.

Practically all the acreage is woodland. The slope is the main limitation to farming and urban use. The hazard of erosion is severe in cultivated areas. The soil is well suited to trees, and growth is good. The potential is medium for most urban use. Capability unit IVe-1; woodland group 3o7.

Shouns Series

The Shouns series consists of deep, well drained, loamy soils. These soils are on foot slopes, side slopes, and benches in the mountains. They formed in material that moved downslope from soils derived from arkosic sandstone, conglomerate, phyllite, quartzite, and slate. Slopes are 12 to 25 percent.

In a representative profile the surface layer is dark grayish brown silt loam 2 inches thick. The subsurface layer is brown silt loam about 7 inches thick. The subsoil is about 47 inches thick. It is strong brown silt loam in the upper part, yellowish red silty clay loam in the next part, and yellowish red loam in the lower part. The underlying material is yellowish red and strong brown channery loam to a depth of 64 inches or more.

Shouns soils are strongly acid throughout the profile. Permeability is moderate, and the available water capacity is high.

Practically all the acreage is forest.

Representative profile of Shouns silt loam, 12 to 25 percent slopes:

A1—0 to 2 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; very friable; few phyllite, quartzite, and sandstone fragments ¼ to 1 inch across; many roots; strongly acid; abrupt smooth boundary.

A2—2 to 9 inches; brown (10YR 5/3) silt loam; moderate medium granular structure; friable; few small fragments of sandstone as much as 1 inch across; many roots; strongly acid; clear wavy boundary.

B1—9 to 14 inches; strong brown (7.5YR 5/6) silt loam; weak medium subangular blocky structure; friable; few small fragments of sandstone as much as 1 inch across; common roots; strongly acid; clear wavy boundary.

B21t—14 to 29 inches; yellowish red (5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; few thin discontinuous clay films on faces of peds; few fragments as much as 2 inches across; common roots; strongly acid; clear wavy boundary.

B22t—29 to 39 inches; yellowish red (5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; many thin discontinuous clay films on faces of peds; about 8 percent by volume fragments of sandstone as much as 6 inches across; few roots; strongly acid; clear wavy boundary.

B3—39 to 56 inches; yellowish red (5YR 5/6) loam; common fine and medium faint strong brown, yellowish brown, and red mottles; moderate medium and coarse subangular blocky structure; friable; about 15 percent by volume fragments of sandstone, mainly 1 inch to 2 inches across, few are as much as 6 inches across; strongly acid; abrupt irregular boundary.

C—56 to 64 inches; yellowish red (5YR 5/6) and strong brown (7.5YR 5/6) channery loam; 40 percent by volume fragments of sandstone as much as 10 or 12 inches long and 2 inches thick; massive except for rock structure; strongly acid.

Depth to bedrock, largely phyllite, is 5 to 10 feet. The surface area and the solum are 5 to 25 percent coarse fragments, mainly sandstone, conglomerate, phyllite, and quartzite. The C horizon is about 25 to 50 percent coarse fragments. The A1 horizon is very dark grayish brown, dark grayish brown, or dark brown. The A2 horizon is brown, dark yellowish brown, or strong brown silt loam or loam. The B1 horizon is strong brown or yellowish brown. The B2 horizon is yellowish red or red silty clay loam or clay loam. The B3 horizon is yellowish red or red loam, clay loam, or silt loam. The C horizon is similar to the B3 horizon in color and texture but contains more coarse fragments.

SnD—Shouns silt loam, 12 to 25 percent slopes. This is a deep, well drained, loamy soil on foot slopes and benches in the mountains. It has the profile described as representative of the series. Permeability is moderate, and the available water capacity is high.

A few areas where slopes are 5 to 12 percent were included with this soil in mapping. Also included was a small acreage where slopes are 25 to 50 percent.

Most of the acreage is forest. The few cleared areas are used for pasture and wildlife plantings. Almost all locally grown crops are well suited. The soil is well suited to trees and growth is good. The slope is the main limitation in farming. This same limitation causes a medium potential for most urban use. Capability unit IVe-1; woodland group 3o7.

Spivey Series

The Spivey series consists of deep, well drained, steep, cobbly soils in coves and on the lower part of mountainsides. These soils formed in material that moved downslope from mountains underlain by arkosic sandstone, conglomerate, phyllite, and slate. Slopes are 20 to 60 percent.

In a representative profile the surface layer is very dark brown cobbly loam about 12 inches thick. The subsoil, to a depth of 48 inches, is dark yellowish brown and brown, friable cobbly loam. The underlying material to a depth of 60 inches is yellowish brown, friable cobbly loam.

Spivey soils are strongly acid or very strongly acid throughout the profile. Permeability is moderate and moderately rapid, and the available water capacity is medium.

These soils are in forest and are well suited to this use. Poplar, red oak, white oak, basswood, hickory, silver bell, white pine, and hemlock are dominant.

Representative profile of Spivey cobbly loam, 20 to 60 percent slopes:

A1—0 to 12 inches; very dark brown (10YR 2/2) cobbly loam; moderate medium granular structure; very friable; many roots; about 60 percent by volume rock fragments ranging from small slate and phyllite chips to arkose fragments 15 inches or more across; strongly acid; clear irregular boundary.

B1—12 to 22 inches; dark yellowish brown (10YR 4/4) cobbly loam; few pockets and former root channels filled with very dark brown (10YR 2/2); weak medium and fine subangular blocky structure; friable; many roots; about 50 percent by volume arkose, shale, and phyllite fragments of varied shapes and sizes ranging to as much as 15 inches in size; strongly acid; clear wavy boundary.

B2—22 to 36 inches; brown (7.5YR 4/4) cobbly loam; weak medium subangular blocky structure; friable; many roots; about 40 percent by volume arkose, slate, and phyllite fragments ranging to as much as 12 inches in size; strongly acid; gradual wavy boundary.

B3—36 to 48 inches; dark yellowish brown (10YR 4/4) cobbly loam; weak medium and fine subangular blocky structure; friable; common roots; about 35 percent by volume arkose, slate, and phyllite fragments ranging to as much as 12 inches in size; strongly acid; gradual wavy boundary.

C—48 to 60 inches; yellowish brown (10YR 5/4) cobbly loam; weak medium subangular blocky structure, massive in places; friable; few roots; about 25 percent by volume arkose, slate, and phyllite fragments as much as 12 inches in size; strongly acid.

Depth to bedrock ranges from 40 to 75 inches or more. Fragments of slate, phyllite, and arkose range from 40 to 70 percent of the A1 and B1 horizons, from 30 to 60 percent of the B2 and B3 horizons, and from 20 to 60 percent in the C horizon. Fragments are mainly 1 inch to 12 inches in size, but some arkose and graywacke fragments are as large as 3 feet in diameter. The fine earth fractions of each horizon is silt loam or loam and in a few profiles subhorizons are sandy loam. The A horizon is very dark brown, very dark grayish brown, dark brown, and black. The B and C horizons are brown, dark yellowish brown, yellowish brown, or strong brown.

SpF—Spivey cobbly loam, 20 to 60 percent slopes. This deep, well drained soil is in coves, in hollows, or on the lower mountainsides.

Included in mapping were small areas that have very few cobbles, a few areas that are more than 70 percent cobbles, and some tracts where slopes are more than 60 percent. Also included were small areas of a soil where the surface layer is light brown.

The steep slopes and the high content of cobbles limit use of this soil. Woodland is well suited. Northern red oak, white oak, basswood, hickory, yellow-poplar, silver bell, white pine, and hemlock are dominant. The slope is a limitation to most farm and urban uses, and the potential is low. Cuts for roads are subject to landslides. Capability unit VIIs-1; woodland group 2x9.

Staser Series

The Staser series consists of deep, well drained soils that are mainly along the Tellico River. These soils formed in sediment on first bottoms that washed from the Smoky Mountains. Slopes are 0 to 2 percent.

In a representative profile the soil is dark brown loam to a depth of 35 inches. Below this, to a depth of 52 inches or more, is dark yellowish brown fine sandy loam.

Staser soils have good tilth, but are frequently flooded for very brief periods during winter and spring. They are medium acid to neutral. Permeability is moderate and moderately rapid, and the available water capacity is high. Runoff is slow.

These soils are suited to most crops commonly grown in the county. Corn, soybeans, vegetables, hay, and pasture are the main crops. Practically all the acreage has been cleared.

Representative profile of Staser loam:

Ap—0 to 8 inches; dark brown (10YR 3/3) loam; moderate medium granular structure; very friable; many roots; few fine mica flakes; slightly acid; clear smooth boundary.

A12—8 to 24 inches; dark brown (10YR 3/3) loam; weak medium subangular blocky and medium granular structure; friable; common fine roots; few fine mica flakes; few pebbles about ½ inch in diameter in lower part; medium acid; clear smooth boundary.

A13—24 to 35 inches; dark brown (10YR 3/3) loam; weak fine subangular blocky structure; friable; few fine roots; few mica flakes; very few pebbles about ½ inch in diameter; medium acid; gradual smooth boundary.

B—35 to 52 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak fine subangular blocky structure; very friable; few fine mica flakes; medium acid.

Depth to bedrock is 6 feet or more. The A horizon is dark brown, very dark grayish brown, or very dark brown loam, silt loam, or fine sandy loam. The B horizon is brown, dark yellowish brown, or yellowish brown fine sandy loam to silt loam. In some profiles, there is a dark yellowish brown, or yellowish brown, or brown loam or fine sandy loam C horizon.

Ss—Staser loam. This deep, well drained soil is on flood plains of the Tellico River. Slopes are 0 to 2 percent.

Included with this soil in mapping were small areas of a soil on second bottoms that has a yellowish clay loam subsoil. Also included were spots of a soil that has gray mottles at a depth of about 20 inches.

This soil is well suited to farming. Crop response is excellent to good management, and most crops commonly grown are suited. Because the soil is nearly level, the hazard of erosion is slight and row crops can be grown each year. The frequent, very brief flooding is the main limitation. Because of flooding, the potential is low for most urban use. This soil is an excellent source of topsoil. Capability unit I-1; woodland group 2o7.

Statler Series

The Statler series consists of deep, loamy, well drained soils. These soils are on low terraces or second bottoms, mostly along the Little Tennessee River and Tellico River. They formed in sediment washed from the Smoky Mountains. Slopes are 0 to 2 percent.

In a representative profile the surface layer is very dark grayish brown loam about 9 inches thick. The subsoil, to a depth of about 50 inches, is brown, friable loam. The underlying material to a depth of 60 inches is brown, friable loam. Small flakes of mica are common throughout the profile.

Statler soils are medium acid or strongly acid throughout the profile. Where limed, the surface layer is less acid. Most areas are flooded occasionally for very brief periods. The available water capacity is high, and permeability is moderate.

These soils are used intensively for row crops, pasture, and hay.

Representative profile of Statler loam:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) loam; weak fine granular structure; very friable; many roots; common fine mica flakes; slightly acid; clear smooth boundary.

B1—9 to 16 inches; brown (7.5YR 4/4) loam; few dark grayish brown (10YR 3/2) streaks and coatings; weak medium subangular blocky structure; friable; many roots; common fine mica flakes; medium acid; gradual smooth boundary.

B2t—16 to 38 inches; brown (7.5YR 4/4) loam; weak fine and medium subangular blocky structure; friable; common roots; few thin discontinuous clay films on faces of peds; common fine mica flakes; medium acid; gradual smooth boundary.

B3—38 to 50 inches; brown (7.5YR 5/4) loam; weak medium subangular blocky structure; friable; few roots; common fine mica flakes; medium acid; gradual smooth boundary.

C—50 to 60 inches; brown (7.5YR 5/4) loam; weak fine subangular blocky structure; very friable; common fine mica flakes; medium acid.

The Ap horizon is dark brown, very dark grayish brown, or, rarely, dark yellowish brown loam or silt loam 7 to 10 inches thick. The B horizon most commonly is brown and ranges to strong brown and dark yellowish brown. It is clay loam, loam, silt loam, or occasionally fine sandy loam to a depth of 30 inches or more. The C horizon is brown or yellowish brown loam, silt loam, or fine sandy loam.

St—Statler loam. This deep, well drained soil is in tracts of 2 to 5 acres on low terraces, mainly along the Little Tennessee River and Tellico River. Slopes are 0 to 2 percent.

Included with this soil in mapping were a few areas of a soil where the surface layer and subsoil are sandy loam. Also included were spots of a moderately well drained soil on low terraces that has gray mottles between depths of 15 and 20 inches and areas where slopes are more than 2 percent.

This soil is highly productive. It is well suited to a wide range of crops, including corn, burley tobacco, vegetables, and soybeans. There are no serious management concerns in farming. Flooding generally does not damage crops. Most areas are nearly level, and cultivated crops can be grown each year. Because most areas are occasionally flooded very briefly, the potential is low for most urban use, such as dwellings. Capability unit I-1; woodland group 2o7.

Steekee Series

The Steekee series consists of well drained, loamy soils on high ridges. These soils formed in material weathered from reddish, calcareous sandstone and sandy shale. Depth to hard rock is 20 to 40 inches. The upper few inches of the rock is weathered and can be dug with hand tools. Slopes are 20 to 50 percent.

In a representative profile the surface layer is dark reddish brown fine sandy loam about 1 inch thick. The subsurface layer is dark reddish brown loam about 4 inches thick. The subsoil is reddish brown loam that extends to soft rock at a depth of 18 inches. Fragments of sandy shale and sandstone are scattered throughout the profile, especially in the lower part.

Steekee soils are strongly acid or very strongly acid.

The response to management is low. The available water capacity is low, and permeability is moderate.

Practically all the acreage is mixed hardwood and pine forest. The few cleared areas are used for pasture.

Representative profile of Steekee loam, 20 to 50 percent slopes:

A1—0 to 1 inch; dark reddish brown (5YR 3/2) fine sandy loam; weak fine granular structure; very friable; strongly acid; abrupt smooth boundary.

A2—1 inch to 5 inches; dark reddish brown (5YR 3/3) loam; weak medium granular structure; very friable; many roots; 5 percent by volume small fragments of sandstone; strongly acid; clear wavy boundary.

B21—5 to 10 inches; reddish brown (5YR 5/4) loam; weak medium subangular blocky structure; friable; common roots; 5 percent by volume fragments of reddish sandstone; strongly acid; clear smooth boundary.

B22—10 to 18 inches; reddish brown (5YR 4/4) channery loam; weak medium subangular blocky structure; friable; common roots; about 15 percent by volume fragments of reddish sandstone ranging to as much as 4 inches long; strongly acid.

C—18 to 24 inches; rippable sandstone and sandy shale; thin seams of reddish loam in cracks and coating rock fragments.

R—24 inches; hard calcareous sandstone and sandy shale rock.

Depth to rippable reddish, calcareous sandstone and reddish sandy shale ranges from 12 to 20 inches. Depth to hard rock ranges from 20 to 40 inches. Soft and hard fragments of reddish sandstone and reddish shale are throughout the soil. Generally, these fragments increase in number and size as depth increases and range from about 5 to 15 percent, by volume, of the A horizon and from about 10 to 25 percent, by volume, of the B horizon. The A2 horizon is dark reddish brown, reddish brown, dark reddish gray, or brown loam or fine sandy loam. The B horizon is reddish brown, yellowish red, or dark reddish brown loam or fine sandy loam.

SvF—Steekee loam, 20 to 50 percent slopes. This soil is on the sides of high, frequently dissected ridges. It is dominantly on south- and west-facing side slopes. Typically, the soil is about 18 inches deep to soft reddish sandstone and sandy shale. The upper few inches of the bedrock has been softened by weathering.

Included with this soil in mapping were a few small areas of a soil that has a silty clay subsoil underlain by grayish shale. Numerous outcrops of bedrock are on some of the points of ridges. Also included were small areas of a soil that is more than 40 inches deep over rock.

This soil is best suited to forest. Mixed hardwoods and pines are dominant. Because of the steep slopes and the depth over bedrock, the soil is poorly suited to row crops or pasture. Many small cleared areas have reseeded to Virginia pine. Tree growth is slow. Because of the slope and the depth over bedrock, the potential is low for urban use. Capability unit VIIe-2; woodland 4d3.

Sylco Series

The Sylco series consists of moderately deep, well drained, steep, channery soils that formed in material weathered from phyllite and slate. These soils are on mountainsides. Elevation is about 2,500 to 4,500 feet. Slopes are about 25 to 65 percent.

In a representative profile the surface layer is very dark grayish brown channery silt loam about 1 inch thick. The subsurface layer is brown channery silt loam about 4 inches thick. Below this, to a depth of 33 inches, is dark yellowish brown and strong brown, friable, channery silt loam that is underlain by hard phyllite bedrock.

Sylco soils are strongly acid or very strongly acid throughout the profile. Permeability is moderate, and the available water capacity is moderately low.

Practically all the acreage is forest. Chestnut oak, scarlet oak, white oak, Virginia pine, pitch pine, maple, hickory, and sourwood are dominant.

Representative profile of Sylco channery silt loam, 25 to 65 percent slopes:

A1—0 to 1 inch; very dark grayish brown (10YR 3/2) channery silt loam; weak fine granular structure; very friable; 10 percent by volume fragments of phyllite as much as 10 inches long; many roots; strongly acid; abrupt smooth boundary.

A2—1 inch to 5 inches; brown (10YR 4/3) channery silt loam; weak medium granular structure; very friable; many roots; about 20 percent by volume flat fragments of phyllite as much as 3 inches long; strongly acid; clear smooth boundary.

B1—5 to 12 inches; dark yellowish brown (10YR 4/4) channery silt loam; weak medium and fine subangular blocky structure; friable; many roots; about 20 percent by volume thin, flat fragments of phyllite ranging from less than 1 inch to about 4 inches long; strongly acid; gradual smooth boundary.

B2—12 to 24 inches; strong brown (7.5YR 5/6) channery silt loam; weak medium and fine subangular blocky structure; friable; many roots; about 30 percent by volume thin flat fragments of phyllite ranging from less than 1 inch to about 4 inches long; strongly acid; gradual smooth boundary.

C—24 to 33 inches; strong brown (7.5YR 5/6) channery silt loam; weak medium subangular blocky structure; friable; common roots; about 60 percent by volume flat fragments of phyllite as much as 6 inches long; strongly acid.

R—33 inches; hard phyllite rock.

Depth to bedrock is 20 to 40 inches. Slate or phyllite fragments range from about 10 to 30 percent, by volume, of the A horizon, from 15 to 35 percent of the B horizon, and from 40 to 80 percent of the C horizon. The A1 horizon is very dark grayish brown or dark grayish brown. The A2 horizon is brown or yellowish brown. The B horizon is yellowish brown, dark yellowish brown, brown, or strong brown. The C horizon is similar in color to the B horizon.

SyF—Sylco channery silt loam, 25 to 65 percent slopes. This moderately deep, well drained soil is mainly on mountainsides. It formed in material weathered from phyllite or slate at an elevation of 2,500 to 4,500 feet.

Included with this soil in mapping were similar soils on ridgecaps where slopes are less than 25 percent and small areas of a soil that has fewer coarse fragments throughout the profile. Also included were small areas, especially on ridgepoints, of a soil that is less than 20 inches deep over phyllite rock and numerous, small areas of a soil in coves and on lower parts of side slopes that are brown or dark brown loam or silt loam throughout and are more than 40 inches deep over bedrock.

Nearly all the acreage is forest. The soil is best suited to this use, but tree growth is fairly slow. Virginia pine and pitch pine are on the southerly aspect and ridgetops. Mixed hardwoods of oak, maple, sourwood, hickory, and a few hemlocks and white pines are on northern slopes. Because of the steep slopes and the depth over bedrock, the potential is low for most farm and urban use. Road cuts are subject to landslides. Capability unit VIIe-2; woodland group 4r3.

Talbott Series

The Talbott series consists of moderately deep, well drained soils that have a plastic clayey subsoil. These soils are on low-lying hills in a narrow belt extending northeast and southwest of the Fork Creek Community. They formed in residuum weathered from limestone. Slopes are 5 to 40 percent.

In a representative profile the surface layer is brown silt loam about 5 inches thick. The subsoil is plastic clay and extends to bedrock at a depth of 34 inches. It is yellowish red in the upper part, strong brown in the next part, and yellowish brown in the lower part. It is mottled in shades of red, brown, and yellow.

Talbott soils are fairly easy to work, except where the plow layer is the clayey subsoil material. They are mainly strongly acid. Where limed, the surface layer is less acid, and a thin layer just above the limestone bedrock ranges from medium acid to mildly alkaline. Permeability is moderately slow, and the available water capacity is medium to low depending on depth to rock. Runoff is rapid.

These soils are used mostly for hay and pasture. Many steep areas are in forest.

Representative profile of Talbott silt loam, 5 to 12 percent slopes, eroded:

Ap—0 to 5 inches; brown (10YR 4/3) silt loam; moderate medium granular structure; friable; many roots; abrupt smooth boundary.

B21t—5 to 11 inches; yellowish red (5YR 5/6) clay; few medium distinct brown (10YR 4/3) mottles; moderate fine angular blocky structure; firm; plastic; few thin discontinuous clay films on faces of peds; few fine dark concretions; common roots; strongly acid; clear smooth boundary.

B22t—11 to 16 inches; yellowish red (5YR 5/6) clay; common medium distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) mottles; moderate fine and medium angular blocky structure; very firm; plastic; thin continuous clay films on faces of peds; few fine dark concretions; common roots; strongly acid; clear wavy boundary.

B23t—16 to 28 inches; strong brown (7.5YR 5/6) clay; many medium distinct yellowish red (5YR 5/6) mottles; plastic; moderate fine and medium angular blocky structure; very firm; thin continuous clay films on faces of peds; few fine dark concretions; common roots; strongly acid; clear smooth boundary.

B24t—28 to 34 inches; yellowish brown (10YR 5/6) clay, common medium distinct yellowish red (5YR 5/6) mottles; weak fine and medium angular blocky structure; very firm; plastic; few thin discontinuous clay films on faces of peds; few fine dark concretions; few roots; neutral.

R—34 inches; limestone bedrock.

The Ap horizon is 4 to 7 inches thick. It is mainly brown, yellowish brown, or strong brown silt loam or silty clay loam. In severely eroded areas, it is yellowish red silty clay or clay. The B horizon is clay or silty clay. It is yellowish red or red in the upper part and red, yellowish red, strong brown, or yellowish brown in the lower part. Depth to bedrock ranges from 20 to 40 inches.

TaC2—Talbott silt loam, 5 to 12 percent slopes, eroded. This moderately deep, well drained soil is in tracts of 3 to 10 acres on hilltops. It has the profile described as representative of the series.

Included with this soil in mapping were spots of soils in depressions that are brown, friable silt loam to a depth of 30 inches or more. Also included were numerous severely eroded spots within most mapped areas where the surface layer is strong brown or yellowish red silty clay loam or clay and numerous small areas that are more than 40 inches deep over bedrock.

This soil is fairly well suited to hay and pasture. Orchardgrass, tall fescue, annual lespedeza, sericea lespedeza, white clover, and red clover are suited. Response to improved management is limited by the medium available water capacity. The depth over bedrock, the moderately slow permeability, and a clayey subsoil affect use of this soil. Runoff and the hazard of erosion severely limit the soil for row crops, except in a cropping system that includes adequate soil-conserving measures. The potential is low for most urban use. Capability unit IVe-5; woodland group 3c2.

TaD2—Talbott silt loam, 12 to 20 percent slopes, eroded. This moderately deep, well drained soil is in tracts of 3 to 10 acres on short hillsides. The surface layer is brown and is 4 to 7 inches thick. The subsoil is dominantly yellowish red and strong brown, plastic clay mottled in shades of yellow, brown, and red. Depth to bedrock ranges from 20 to 40 inches.

Included with this soil in mapping were small areas of a soil less than 20 inches deep over bedrock and a few outcrops of limestone. Also included were numerous, severely eroded spots where the surface layer is reddish silty clay loam or clay.

This soil is suited to pasture or trees. Use of the soil is limited by the slope, the low available water capacity, the moderately slow permeability, the clayey subsoil, and the depth over rock. Tall fescue, sericea lespedeza, and white clover are suited. Tree growth is medium. The potential is low for most urban use. Capability unit VIe-2; woodland group 3c2.

TbC3—Talbott clay, 5 to 12 percent slopes, severely eroded. This moderately deep, well drained soil is in tracts of 3 to 10 acres. It is mostly on hilltops and short hillsides. Slopes are dominantly 8 to 12 percent. The surface layer is yellowish red and plastic and is about 5 inches thick. The subsoil is yellowish red, red, or strong brown, plastic clay mottled in shades of brown, yellow, and red. Depth to limestone bedrock is mostly 20 to 30 inches.

Included with this soil in mapping were small areas of a less eroded soil where the surface layer is brownish silt loam or silty clay loam. Also included were a few gullies 12 to 24 inches deep and some outcrops of limestone.

This soil is fairly well suited to pasture and trees. Tall fescue, sericea lespedeza, and white clover are suited. The soil has poor workability and seedling mortality is high because of the clayey surface layer. Row crops are poorly suited. Trees make fairly slow growth, but they help to control erosion. Because of the moderate depth over bedrock, the moderately slow permeability, and the clayey texture, the potential is low for most urban use. Capability unit VIe-2; woodland group 4c3e.

TbD3—Talbott clay, 12 to 20 percent slopes, severely eroded. This moderately deep soil is on hillsides. The surface layer is yellowish red and plastic. The subsoil is a yellowish red, red, or strong brown, plastic clay mottled in shades of brown, yellow, and red. Depth to bedrock is mostly 20 to 30 inches.

Included with this soil in mapping were areas, less than 3 acres in size, of rocky and steep soils and soils less than 20 inches deep over bedrock. Also included were a few shallow gullies and a few areas where the surface layer is brownish silt loam or silty clay loam.

This soil is best suited to permanent pasture or trees. Seedbeds are difficult to prepare, and seedling mortality is high because of the clayey surface layer. Most areas, if left idle, revert to redcedar. Because of the moderate depth, the moderately steep slopes, the clayey texture, and the moderately slow permeability, the potential is low for cultivated crops and urban use. Capability unit VIe-2; woodland group 4c3e.

TcD—Talbott-Rock outcrop complex, 5 to 20 percent slopes. This mapping unit consists of small areas of Talbott soils and limestone outcrop so intermingled they could not be separated at the scale selected for mapping. It occurs on the sloping hilltops and on the steeper hillsides. Areas are 3 to 15 acres in size.

Talbott silt loam makes up about 50 to 70 percent of the unit. Typically, the surface layer is strong brown silty clay loam about 5 inches thick. The subsoil is plastic clay to a depth of about 34 inches. It is yellowish red in the upper part, strong brown in the next part, and yellowish brown in the lower part. Limestone bedrock is at a depth of about 34 inches.

Outcrops of limestone make up about 20 to 35 percent of the unit. They occur mostly as narrow bands that are parallel to the slope and extend from about 6 to 30 inches above the surface.

Included with this unit in mapping were small areas of Gladeville soils and small areas of a soil that is more than 40 inches deep over bedrock.

More than one half of this mapping unit has been cleared and is used for pasture. The remainder is in woodland or is idle. The unit is best suited to pasture and trees. Growth is slow because of the shallowness of the root zone and the low available water capacity. Pasture is also difficult to mow because of the rocks. Cultivated crops are not suited because the rocks interfere with tillage. The potential is low for most urban use. The rock outcrops and shallowness over bedrock are severe limitations that are difficult to overcome. Capability unit VIs-4; woodland group 4x3.

TcE—Talbott-Rock outcrop complex, 20 to 40 percent slopes. This mapping unit consists of small areas of Talbott soils and limestone outcrops so intermingled they could not be separated at the scale selected for mapping. It occurs mostly as short, steep hillsides adjacent to streams and drainageways. Areas range from 3 to 5 acres in size.

Talbott silt loam makes up about 50 to 65 percent of the unit. Typically, the surface layer is strong brown silty clay loam about 5 inches thick. The subsoil is plastic clay to a depth of about 30 inches. It is yellowish red in the upper part, strong brown in the next part, and yellowish brown in the lower part. Limestone bedrock is at a depth of about 30 inches.

Outcrops of limestone make up about 25 to 40 percent of the unit. They occur mostly as narrow bands that are parallel to the slope and extend from about 6 to 30 inches above the surface.

Included with this unit in mapping were small areas of Gladeville soils and small areas of a soil that is more than 40 inches deep over bedrock.

Most of this mapping unit is in woodland, consisting mainly of eastern redcedar and mixed hardwoods. Some areas are idle and a few are used for unimproved pasture. Because of the steep slopes, the shallowness over bedrock, and the rock outcrops, the potential is low for farming and urban use. Woodland is generally the best use for this unit, although tree growth is slow. Capability unit VIIs-2; woodland group 4x3.

Tellico Series

The Tellico series consists of well drained soils on high hills and knobs. Locally, these soils are referred to as the "red knobs." They formed in residuum from reddish, calcareous sandstone, which contains seams of sandy shale. Slopes are 12 to 60 percent.

In a representative profile the surface layer is dusky red loam 8 inches thick. The subsoil is dusky red, friable clay loam to a depth of 4 inches. Below this is soft sandstone that extends to hard bedrock at a depth of 58 inches.

Tellico soils are strongly acid or very strongly acid throughout the profile. Where limed, the surface layer is less acid. Permeability is moderate, and the available water capacity is medium and high.

Most of the acreage is forest. Small fields on hilltops and a few hillsides have been cleared and are used mostly for pasture. Some tracts, once cleared, have been abandoned and are reverting to trees, mainly Virginia pine. Some of these abandoned areas are severely eroded because of cultivation.

Representative profile of Tellico loam, 35 to 60 percent slopes:

A1—0 to 8 inches; dusky red (2.5YR 3/2) loam; moderate medium and fine granular structure; very friable; many roots; strongly acid; gradual smooth boundary.

B21t—8 to 15 inches; dusky red (10R 3/4) clay loam; moderate medium subangular blocky structure; friable; common roots; few thin discontinuous clay films on faces of some peds; strongly acid; gradual smooth boundary.

B22t—15 to 28 inches; dusky red (10R 3/4) clay loam; moderate medium continuous clay films on faces of peds; few soft sandstone fragments as much as 3 inches across; strongly acid; gradual smooth boundary.

B23t—28 to 44 inches; dusky red (10R 3/4) clay loam; weak medium subangular blocky structure; friable; few fine roots; many thin discontinous clay films on faces of peds; about 15 percent by volume soft sandstone fragments as much as 3 inches across; strongly acid; gradual smooth boundary.

C—44 to 58 inches; soft reddish sandstone that contains thin seams and coatings of dusky red clay loam; strongly acid; gradual smooth boundary.

R—58 inches; hard reddish calcareous sandstone.

Depth to bedrock ranges from 40 to 60 inches. Fragments of sandstone range from 0 to 15 percent, by volume, of the A and B horizons. The A horizon is mainly dusky red or dark reddish brown loam 4 to 9 inches thick. In eroded areas, however, it is clay loam. The B horizon is dusky red, dark reddish brown, or dark red clay loam, clay, or sandy clay.

TeD—Tellico loam, 12 to 20 percent slopes. This well drained, reddish soil is on broad ridgecaps and hillsides in tracts of 3 to 20 acres. It formed in residuum from reddish sandstone. The surface layer is dark reddish brown or dusky red and is about 5 to 8 inches thick. The subsoil is dark reddish brown, dark red, or dusky red clay loam, sandy clay, or clay. Hard bedrock is at a depth of about 3½ to 5 feet.

Included with this soil in mapping were small areas where the surface layer is brown sandy loam, the subsoil is red loam, and bedrock is at a depth of 2 to 4 feet. Also included were small areas of severely eroded Tellico soils where the surface layer is clay loam.

Use of this soil for cultivated crops is limited by the moderately steep slopes and the high erodibility. The soil is better suited to permanent pasture and trees. Tall fescue, sericea lespedeza, and white clover are some suitable pasture plants. Mixed hardwood and pine are in uncleared areas. Cleared areas left idle are reseeding to almost pure stands of Virginia pine. Because of the slope and the depth over rock, the potential is medium for most urban use. Capability unit IVe-2; woodland group 3o7.

TeE—Tellico loam, 20 to 35 percent slopes. This deep, well drained soil is on hillsides. Most areas are 5 to 25 acres in size. The surface layer is dark reddish brown or dusky red and is about 5 to 8 inches thick. The subsoil is dusky red or dark red, friable clay loam or clay. Bedrock is at a depth of 40 to 60 inches.

Included along drainageways with this soil in mapping were small areas of a soil that is loamy throughout and is more than 5 feet deep over bedrock. Also included were a few small severely eroded areas where the surface layer is clay loam.

Because slopes are steep, this soil is limited to trees and pasture. Pasture is difficult to establish and maintain. Tall fescue and bermudagrass are best suited. Oak, hickory, yellow-poplar, beech, and black locust are in uncleared areas. Cleared areas that were left idle are reverting to almost pure stands of Virginia pine. The soil erodes rapidly if disturbed and it is highly susceptible to landslides if cuts are made in the slopes. Because of the slope and depth over rock, the potential is low for most urban use. Capability unit VIe-1; woodland group 3r8.

TeF—Tellico loam, 35 to 60 percent slopes. This deep, well drained soil is on hillsides. It has the profile described as representative of the series. Areas range from 5 to 30 acres in size.

Included with this soil in mapping were a few areas of a soil that is sandy loam or loam throughout and is 20 to 36 inches deep over bedrock. Also included along drainageways were a few small areas of a soil 5 to 10 feet deep and a few rock outcrops.

The slope is the main limitation to use of this soil. The soil is best suited to trees, which are moderately productive. Because of the very steep slopes, the potential is low for most urban use. Road cuts are subject to landslides. Capability unit VIIe-1; woodland group 3r8.

ToD3—Tellico clay loam, 12 to 20 percent slopes, severely eroded. This deep, well drained soil is in tracts of 3 to 20 acres, mostly on winding ridgetops and hillsides. The surface layer, which is mainly material from the original subsoil, is dark reddish brown, friable clay loam. The subsoil is dark reddish brown or dusky red, friable clay loam. Bedrock is typically at a depth of about 3½ to 4 feet. A few gullies, 1 foot to 4 feet deep, occur in most areas (fig. 8).

Small areas of a reddish clayey soil underlain by shale at a depth of 2 to 3 feet were included with this soil in mapping. Also included were small areas on foot slopes and along narrow drainageways of a soil that is 5 to 10 feet deep over rock.

This soil is suited to permanent pasture or trees. It erodes rapidly if plowed. The moderately steep slopes and the moderate depth over rock are the main management concerns for most uses. The clay loam surface layer makes seedbed preparation difficult and seedling mortality high. The soil is susceptible to slippage if cuts are made in the slopes. Tall fescue, white clover, and Midland bermudagrass are well suited. Because of the slope and the depth over rock, the potential is medium for most urban use. Capability unit VIe-1; woodland group 4c3e.

ToE3—Tellico clay loam, 20 to 35 percent slopes, severely eroded. This deep, well drained soil is on hillsides. It is in tracts of 3 to 15 acres, which have been cleared and abandoned and have reverted to pine. The surface layer is reddish and is 10 to 15 percent, by volume, sandstone and shale fragments ½ inch to 2 inches across. The subsoil, to a depth of 2 to 3 feet, is dark red or dusky red, friable clay loam or clay. Below this to a depth of about 4 feet is reddish loam or clay loam that is about 15 percent, by volume, ½- to 3-inch sandstone fragments. Bedrock is at a depth of 3½ to 4 feet. A few gullies 1 foot to 4 feet deep occur in most areas. Included in mapping were small areas of a similar soil that is less than 40 inches deep over rock.

The steep slopes, the severe hazard of erosion, the rapid runoff, and the moderate depth over rock are severe management concerns in farming and urban use. The soil erodes rapidly if disturbed. It is susceptible to landslides if cuts are made. It is too steep for cultivated crops and hay. It is poorly suited to pasture because grasses are difficult to establish and maintain and yields are low. Tall fescue and bermudagrass are suitable plants. The soil is suited to trees, but growth is slow. Cleared tracts that were left idle are reseeding mainly to Virginia pine. The potential is low for most urban use. Capability unit VIe-1; woodland group 4c3e.

TS—Tellico and Dewey soils, gullied. This mapping unit is about 40 to 60 percent Tellico and Dewey soils and 50 to 70 percent gullies. These are moderately deep

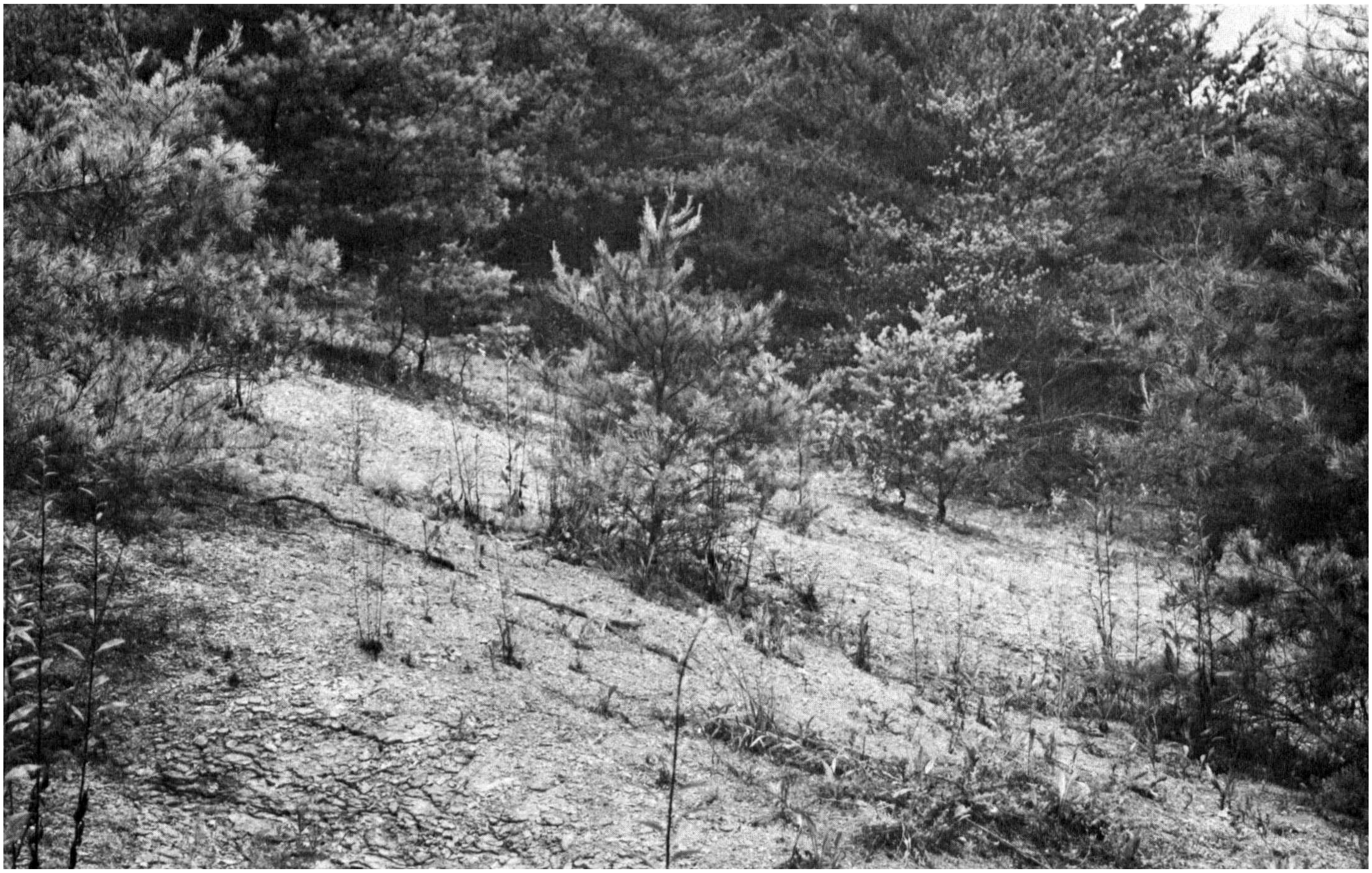


Figure 8.—**Severely eroded Tellico soil. Some gullies are 1 foot to 2 feet deep. Many of these once cleared areas have been abandoned and are reverting to Virginia pine.**

and deep soils on uplands and shallow to deep gullies. Some areas are entirely Tellico soil, some are entirely Dewey soil, and some are both. Slopes are 12 to 30 percent. Individual areas of both soils could be mapped separately, but because of present and predicted use they were not separated in mapping.

Gullies commonly are 1 foot to 6 feet deep. The exposed subsoil in the gullies generally is reddish clay, silty clay, clay loam, or shaly clay loam. Bedrock of limestone, sandy shale, or sandstone is exposed in the bottom of some of the gullies.

Typically, Tellico soils have a dusky red or red loam or clay loam surface layer and a dusky red or red clay loam subsoil. The subsoil is underlain by weathered sandstone that has seams of sandy shale at a depth of 3 to 4 feet. Permeability is moderate, and the available water capacity is medium to high.

Typically, Dewey soils have a dark reddish brown or dark red silt loam, silty clay loam, silty clay, or clay surface layer and a red clay subsoil. Depth to limestone bedrock is more than 5 feet. The available water capacity is medium, and permeability is moderate.

Included with this unit in mapping were small areas of a soil that is shallow over rock and some areas that contain a large volume of chert.

Much of this mapping unit has reverted to forest, mainly eastern redcedar and Virginia pine. Because of the many shallow to deep gullies, the hazard of erosion, and the slope, the potential is low for farming or urban use. Capability unit VIIs-1; woodland group 4c3e.

Transylvania Series

The Transylvania series consists of deep, well drained soils on bottom land along the Little Tennessee River. These soils most commonly are in long narrow strips next to the riverbank. They formed in sediment washed from soils underlain by schist, phyllite, slate, and sandstone. Slopes are 0 to 2 percent.

In a representative profile the soil is friable loam and silt loam to a depth of 70 inches. It is very dark grayish brown and very dark brown in the upper part and brown in the lower part.

Transylvania soils are subject to occasional, very brief flooding. They are medium acid or strongly acid throughout the profile. Where limed, the surface layer is less acid. Permeability is moderate, and the available water capacity is high.

Practically all the acreage has been cleared and is used for row crops.

Representative profile of Transylvania loam:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) loam; weak medium granular structure; very friable; many roots; common mica flakes; medium acid; clear smooth boundary.

A12—10 to 21 inches; very dark brown (10YR 2/2) silt loam; weak medium granular structure; very friable; common roots; common mica flakes; medium acid; clear smooth boundary.

A13—21 to 34 inches; very dark grayish brown (10YR 3/2) silt loam; weak medium granular structure; friable; common roots; common mica flakes; medium acid; gradual smooth boundary.

B—34 to 54 inches; brown (10YR 4/3) silt loam; weak medium subangular blocky structure; friable; few roots; common mica flakes; medium acid; gradual smooth boundary.

C—54 to 70 inches; brown (10YR 4/3) loam; massive; very friable; common mica flakes; strongly acid.

Depth to bedrock is 10 feet or more. The A horizon is dark brown, very dark grayish brown, or very dark brown loam or silt loam. The B horizon is brown, dark yellowish brown, or yellowish brown silt loam or loam. The C horizon is yellowish brown, brown, or light yellowish brown loam, sandy loam, or loamy fine sand and stratified loam or silt loam.

Ty—Transylvania loam. This deep, dark, well drained soil is on the flood plain of the Little Tennessee River. It formed in recent sediment washed from soils underlain by schist, phyllite, slate, and sandstone. Slopes are 0 to 2 percent.

Included with this soil in mapping were small areas of a less well drained soil that has gray mottles at a depth of about 20 inches. Also included were small areas where the soil is 15 percent or more gravel and a few areas of a sandy soil.

This nearly level soil is well suited to crops, hay, and pasture. It can be used every year for cultivated crops. It is well suited to all commonly grown crops that are not affected by brief periods of flooding. Corn, soybeans, tobacco, and truck crops are well suited. The soil is an excellent source of topsoil. Because the occasional, very brief flooding is a limitation, the potential is low for most urban use. Capability unit I-1; woodland group 2o7.

Unicoi Series

The Unicoi series consists of shallow, cobbly, excessively drained soils that formed in arkosic sandstone. These soils are on points, convex side slopes, and narrow ridge crests. Elevation is 2,000 to 4,500 feet. Slopes are 30 to 65 percent.

In a representative profile the surface layer is very dark grayish brown cobbly loam about 1 inch thick. The subsurface layer is brown cobbly loam about 4 inches thick. The subsoil is yellowish brown cobbly loam that extends to arkosic sandstone bedrock at a depth of 16 inches. It is about 45 percent, by volume, stones that range from 2 to 15 inches in diameter.

The Unicoi soils are strongly acid or very strongly acid. Permeability is moderately rapid, and the available water capacity is low.

The entire acreage is forest, consisting mainly of Virginia pine and pitch pine and a few hickory and oak.

Representative profile of Unicoi cobbly loam, 30 to 65 percent slopes:

A1—0 to 1 inch; very dark grayish brown (10YR 3/2) cobbly loam; weak fine granular structure; very friable; many roots; numerous stones as much as 15 inches across on surface; strongly acid; abrupt wavy boundary.

A2—1 inch to 5 inches; brown (10YR 4/3) cobbly loam; weak medium granular structure; very friable; many roots; about 40 percent by volume stones mostly 2 to 15 inches across; very strongly acid; clear wavy boundary.

B2—5 to 16 inches; yellowish brown (10YR 5/4) cobbly loam; weak medium subangular blocky structure; very friable; many roots; about 45 percent by volume stones ranging from 2 to 15 inches in diameter and a few larger ones; very strongly acid.

R—16 inches; arkosic sandstone bedrock.

Depth to bedrock ranges from 7 to 20 inches. The content of arkosic sandstone fragments ranges from 35 to 65 percent, by volume. Fragments range from less than 1 inch to 15 inches in diameter. A few are larger. The A1 horizon is very dark grayish brown, dark grayish brown, or dark brown cobbly loam or cobbly sandy loam. The A2 horizon is brown or yellowish brown cobbly loam or cobbly sandy loam. The B horizon is yellowish brown, dark yellowish brown, or brown.

UcF—Unicoi cobbly loam, 30 to 65 percent slopes. This steep, shallow, excessively drained soil is on points, convex slopes, and narrow ridge crests at an elevation of 2,000 to 4,500 feet. Included in mapping were areas of deeper soils underlain by arkosic sandstone at a depth of more than 20 inches.

All the acreage is forest, consisting mainly of Virginia pine and pitch pine and a few oak and hickory. Because the steep slopes and the shallowness over bedrock severely limit this soil, the potential is low for farming or urban use. Capability unit VIIe-1; woodland group 5x3.

Wallen Series

The Wallen series consists of excessively drained, moderately deep, gravelly soils on mountainsides. They formed in residuum derived from sandstone. Slopes are 20 to 60 percent.

In a representative profile the surface layer is dark grayish brown gravelly fine sandy loam about 2 inches thick. The subsurface layer is brown gravelly fine sandy loam about 4 inches thick. The subsoil is yellowish brown and light yellowish brown gravelly fine sandy loam, cobbly fine sandy loam, and gravelly loam that extends to sandstone bedrock at a depth of 32 inches.

Wallen soils are strongly acid or very strongly acid. The available water capacity is low, and permeability is moderately rapid.

Nearly all the acreage is hardwood and pine forest. Areas that have been cleared are reverting to forest, mainly Virginia pine, red oak, white oak, maple, and hickory.

Representative profile of Wallen gravelly fine sandy loam, 20 to 60 percent slopes:

A1—0 to 2 inches; dark grayish brown (10YR 4/2) gravelly fine sandy loam mixed with some very dark grayish brown (10YR 3/2); weak fine granular structure; very friable; many roots; 15 percent by volume fragments of sandstone 1 inch to 3 inches in diameter; very strongly acid; clear smooth boundary.

A2—2 to 6 inches; brown (10YR 5/3) gravelly fine sandy loam; weak fine granular structure; very friable; common roots; 15 percent by volume fragments of sandstone 1 inch to 3 inches in diameter; very strongly acid; gradual smooth boundary.

B1—6 to 10 inches; light yellowish brown (10YR 6/4) gravelly fine sandy loam; weak fine subangular blocky structure; very friable; 35 percent by volume fragments of sandstone 1 inch to 3 inches in diameter; very strongly acid; clear smooth boundary.

B21—10 to 16 inches; light yellowish brown (10YR 6/4) gravelly fine sandy loam; weak fine subangular blocky structure; very friable; 35 percent by volume fragments of sandstone 1 inch to 3 inches in diameter; common roots; very strongly acid; gradual smooth boundary.

B22—16 to 21 inches; yellowish brown (10YR 5/6) gravelly loam; weak fine subangular blocky structure; very friable; few roots; 40 percent by volume fragments of sandstone 2 to 4 inches in diameter; very strongly acid; gradual smooth boundary.

B3—21 to 32 inches; yellowish brown (10YR 5/6) cobbly fine sandy loam; weak fine subangular blocky structure; very friable; few roots; 45 percent by volume fragments of sandstone 2 to 6 inches in diameter; very strongly acid; abrupt irregular boundary.

R—32 inches; sandstone bedrock.

Depth to bedrock ranges from 20 to 40 inches. Coarse fragments of sandstone are 1 inch to 10 inches in diameter and make up 15 to 25 percent of the A horizon and 35 to 50 percent of the B horizon. The A2 horizon is brown or pale brown gravelly fine sandy loam or gravelly loam. The B horizon is light yellowish brown, yellowish brown, or brownish yellow. The fine earth fraction is loam or fine sandy loam.

WaF—Wallen gravelly fine sandy loam, 20 to 60 percent slopes. This is a moderately deep, excessively drained soil on mountainsides. Included in mapping were narrow strips of a deeper and finer textured soil, mainly on benches and along drainageways and areas that have numerous outcrops of bedrock.

The steep slopes, the depth over rock, and the rock fragments limit the use of this soil, mainly to forest. Most of the acreage is cutover forest of oak, hickory, sourwood, and Virginia pine with an understory of hackberry and mountain laurel. Cleared areas have mainly reseeded to Virginia pine. The potential is low for most urban use. Capability unit VIIs-1; woodland group 4f3.

Waynesboro Series

The Waynesboro series consists of deep, well drained soils on old high terraces. Slopes are 2 to 35 percent.

In a representative profile the surface layer is brown and yellowish brown loam about 11 inches thick. The subsoil extends to a depth of 60 inches. It is yellowish red and red, friable loam and clay loam in the upper part and dark red, firm clay in the lower part.

Waynesboro soils are strongly acid or very strongly acid. Where limed, the surface layer is less acid. Permeability is moderate, and the available water capacity is high.

Most of the acreage has been cleared and is used for crops and pasture. Only the steeper areas remain in forest.

Representative profile of Waynesboro loam, 2 to 5 percent slopes:

Ap—0 to 6 inches; brown (10YR 5/3) loam; weak fine granular structure; very friable; common fine roots; strongly acid; abrupt smooth boundary.

A3—6 to 11 inches; yellowish brown (10YR 5/6) loam; weak fine subangular blocky structure; friable; common fine roots; very strongly acid; clear smooth boundary.

B1—11 to 16 inches; yellowish red (5YR 5/6) loam; weak fine subangular blocky structure; friable; common roots; few small gravel; very strongly acid; gradual smooth boundary.

B21t—16 to 20 inches; yellowish red (5YR 5/6) clay loam; moderate medium subangular blocky structure; friable; common roots; few thin continuous clay films on faces of peds; very strongly acid; gradual smooth boundary.

B22t—20 to 24 inches; red (2.5YR 5/6) clay loam; moderate fine to medium subangular blocky structure; friable; many thin continuous clay films on faces of peds; very strongly acid; gradual smooth boundary.

B23t—24 to 32 inches; dark red (2.5YR 3/6) clay; moderate medium subangular blocky structure; firm; many thin continuous clay films on faces of peds; very strongly acid; gradual smooth boundary.

B24t—32 to 60 inches; dark red (10R 3/6) clay; moderate medium subangular blocky and angular blocky structure; firm; few pebbles and cobbles; few thin discontinuous clay films on faces of peds; very strongly acid.

Depth to bedrock is 6 feet or more. The Ap horizon is mainly brown or yellowish brown loam 4 to 10 inches thick. In severely eroded areas, however, it is yellowish red or red clay loam. The B2 horizon is clay loam, sandy clay, or clay. Cobbles or rounded gravel makes up less than 15 percent, by volume, of each horizon.

WbB—Waynesboro loam, 2 to 5 percent slopes. This deep, well drained soil is in tracts of 3 to 10 acres on high terraces. It has the profile described as representative of the series.

Included with this soil in mapping were a few small areas where the soil is more than 15 percent gravel or cobbles. Also included were spots of a severely eroded Waynesboro soil that has a clay loam surface layer.

This soil is suited to all crops and pasture plants commonly grown in the county. Corn, alfalfa, soybeans, small grain, burley tobacco, and vegetables are well suited. Response to management, especially to additions of lime and fertilizer, is good. The hazard of erosion is a slight limitation if cultivated crops are grown. The potential is high for most urban use. Capability unit IIe-3; woodland group 3o7.

WbC—Waynesboro loam, 5 to 12 percent slopes. This deep, well drained soil is in tracts of 3 to 20 acres on old high terraces. The surface layer is brown and is 5 to 10 inches thick. The upper part of the subsoil is yellowish red or red, friable loam or clay loam that is underlain by several feet of red or dark red clay.

Included with this soil in mapping were a few small areas that are more than 15 percent cobblestones and gravel.

This soil is suited to the commonly grown crops and pasture plants. The slope is the main management concern. The soil is well suited to crops, such as corn, soybeans, alfalfa, burley tobacco, vegetables, and small grain. The hazard of erosion is the main limitation for cultivated crops. The potential is high for most urban uses, such as dwellings, septic tank absorption fields, roads, and sanitary landfills. Capability unit IIIe-3; woodland group 3o7.

WbD—Waynesboro loam, 12 to 20 percent slopes. This deep, well drained soil is in areas of 3 to 10 acres. It is on hillsides of old high terraces. The surface layer is brown and is 5 to 10 inches thick. The upper part of the subsoil is yellowish red or red, friable clay loam, and the lower part is red or dark red firm clay. It is more than 6 feet deep over bedrock.

Included with this soil in mapping were a few small eroded areas where the surface layer is red or yellowish red clay loam and spots where slopes are less than 12 percent or more than 20 percent. Also included were a few areas of a soil that is more than 15 percent gravel and cobblestones throughout the profile.

This soil is suited to all the crops and hay and pasture plants commonly grown in the county. The hazard of erosion is severe if cultivated crops are grown. Because of the slope, the potential is medium for most urban use. Capability unit IVe-1; woodland group 3o7.

WbE—Waynesboro loam, 20 to 35 percent slopes. This deep, well drained soil is in tracts of 3 to 10 acres. It is on hillsides of old high terraces. The surface layer is brown and is 5 to 10 inches thick. The upper part of the subsoil is yellowish red, friable clay loam and the lower part is dark red or red clay many feet thick.

Included with his soil in mapping were small, eroded areas where the surface layer is reddish clay loam. A few small areas are more than 15 percent rounded gravel or cobblestones on the surface and throughout the soil.

This soil is limited by the steep slopes. It is suited to perennial pasture or trees. Tall fescue, bermudagrass, and white clover are suitable pasture plants. The steep slopes make pasture difficult to establish. Tree growth is medium. Because of the slopes, the potential is low for most urban use. Capability unit VIe-1; woodland group 3r8.

WnC3—Waynesboro clay loam, 5 to 12 percent slopes, severely eroded. This deep, well drained soil is in areas of 3 to 10 acres on low-lying hills that make up old, high terraces. Erosion has removed most of the original surface layer. The present surface layer consists mostly of the former subsoil and is yellowish red or red, friable clay loam 4 to 6 inches thick. The subsoil is yellowish red, friable clay loam in the upper part and dark red firm clay in the lower part. In most places there are a few cobbles and pebbles on the surface and throughout the soil. A few shallow gullies are in most of the areas. Included in mapping were small areas that are 15 percent or more rounded gravel or cobblestones throughout the soil.

The slope and the clay loam surface layer are the main limitations in farming. The soil is best suited to hay and pasture because of the hazard of erosion if cultivated. Tall fescue, orchardgrass, alfalfa, white clover, red clover, and sericea lespedeza are suited. If row crops are grown, erosion-control measures are needed. Response is good to improved management, such as additions of lime and fertilizer. The potential is medium to high for most urban use. Capability unit IVe-1; woodland group 4c3e.

WnD3—Waynesboro clay loam, 12 to 20 percent slopes, severely eroded. This deep, well drained soil is in areas of 3 to 10 acres. It is on hillsides of old high terraces. Erosion has removed most of the original surface layer. The present surface layer, which is mostly subsoil material, is yellowish red or red clay loam. The subsoil is yellowish red or red, friable clay loam in the upper part and red or dark red clay in the lower part. A few cobblestones and pebbles are on the surface and throughout the soil in most places. Included in mapping were small areas of a soil that has numerous cobblestones or rounded gravel throughout and small areas of a soil where slopes are less than 12 percent or more than 20 percent.

The slope and the clay loam surface layer are the main limitations in farming. This soil is subject to a high rate of erosion unless it is in sod coverage or wooded. Tall fescue, alfalfa, white clover, bermudagrass, and sericea lespedeza are suited. Pasture production is medium under a high level of management. The soil is suited to trees, but the growth rate is fairly low. Because of the slope, the potential is medium for most urban use. Capability unit VIe-1; woodland group 4c3e.

Whitwell Series

The Whitwell series consists of deep, moderately well drained soils on low stream terraces. These soils formed in mixed sediment washed mainly from soils that are underlain by sandstone, siltstone, and shale. Slopes are 0 to 2 percent.

In a representative profile the surface layer is brown loam about 10 inches thick. The subsoil to a depth of 35 inches is yellowish brown, friable loam and clay loam that has grayish mottles in the lower part. Below this and extending to a depth of 60 inches is mottled, friable loam.

Whitwell soils are easy to work and respond well to management. In some places they are subject to occasional flooding for brief periods. They are strongly acid throughout the profile. Where limed, the surface layer is less acid. Permeability is moderate, and the available water capacity is high.

These soils are used for corn, small grain, hay, and pasture.

Representative profile of Whitwell loam:

Ap—0 to 10 inches; brown (10YR 4/3) loam; weak medium granular structure; very friable; many roots; medium acid; clear smooth boundary.

B21t—10 to 20 inches; yellowish brown (10YR 5/6) clay loam; few fine faint pale brown mottles; weak fine subangular blocky structure; friable; few roots; few small sandstone fragments; few thin discontinuous clay films on faces of peds; strongly acid; clear smooth boundary.

B22t—20 to 35 inches; yellowish brown (10YR 5/6) loam; common medium faint light brownish gray (10YR 6/2) and pale brown (10YR 6/3) mottles and common medium distinct reddish brown (5YR 4/4) mottles; weak fine subangular blocky structure; few thin discontinuous clay films on faces of peds; few small sandstone and quartzite fragments; strongly acid; clear smooth boundary.

B3—35 to 41 inches; mottled brown (10YR 4/3), reddish brown (5YR 4/4), pale brown (10YR 6/3), and light brownish gray (10YR 6/2) loam; moderate medium subangular blocky structure; friable; few sandstone and shale fragments; strongly acid: clear smooth boundary.

C—41 to 60 inches; mottled light yellowish brown (10YR 6/4), pale brown (10YR 6/3), and light brownish gray (10YR 6/2) loam; weak fine subangular blocky structure; friable; 15 percent by volume shale fragments less than 2 inches in diameter and sandstone and quartzite fragments less than ½ inch in diameter; strongly acid.

The Ap horizon is brown or strong brown loam or silt loam 5 to 10 inches thick. The B horizon is yellowish brown, strong brown, or brown loam or clay loam mottled in shades of gray. In some profiles the C horizon is gravelly or cobbly loam, sandy loam, or clay loam. Shale or limestone bedrock is at a depth of more than 5 feet.

Wt—Whitwell loam. This deep, moderately well drained soil is on low stream terraces. Slopes are 0 to 2 percent.

Included with this soil in mapping were a few small areas of a deep, well drained soil that does not have gray mottles in the subsoil. Also included were a few small pockets of a somewhat poorly drained soil that is dominantly gray in the subsoil.

This soil is suited to most commonly grown crops. Such crops as alfalfa, burley tobacco, and small grain are not so well suited because of wetness. Because the soil is nearly level, row crops can be grown every year without erosion damage. Open ditch or tile drainage systems should be considered. Areas that are not subject to flooding have a medium potential for most urban use. Onsite inspection is needed to determine the limitation of flooding. Capability unit IIw-2; woodland group 2w8.

Use and Management of the Soils

The following pages define general principles of management that apply to all soils used for farming in Monroe County. They explain the capability classification and list estimated yields per acre of principal crops under two levels of management. Also on the pages that follow is information on woodland, wildlife habitat, and engineering, and on selected uses of soils to be considered in planning recreational facilities.

General Principles of Soil Management

Some principles of management are general enough to apply to all soils suitable for farming throughout the county, but individual soils or groups of soils require different kinds of management. These general principles of management are discussed in the following paragraphs.

Many soils in the county need lime or fertilizer or both. The amounts needed depend on the natural content of lime and plant nutrients, which are determined by laboratory analyses of soil samples; on the needs of the crops; and on the level of yield desired. Only general suggestions for applications of lime and fertilizer are given.

Most of the soils in Monroe County were never high in content of organic matter, and to build up the content to a high level is not economical. It is important, however, to return organic matter to the soil by adding farm manure; leaving plant residue on the surface; and growing sod crops, cover crops, and green-manure crops.

Tillage tends to break down soil structure. It should be kept to the minimum necessary to prepare a seedbed and control weeds. Maintaining the organic-matter content of the plow layer also helps to protect the structure.

On wet soils, such as Newark silt loam, yields of cultivated crops can be increased by open ditch drainage or tile drainage. Tile drains are costly to install, but they generally provide better drainage than open ditches. Soils that have a fragipan are difficult to drain. They can generally be drained better by open ditches than by tile. Open ditch drainage is more effective if the ditches intercept the water as it moves horizontally on top of the fragipan. For drainage by either tile or open ditches, suitable outlets are needed.

All of the gently sloping and steeper cultivated soils are subject to erosion. Runoff and erosion occur mostly while a cultivated crop is growing or soon after one has been harvested. On erodible soils, such as Dewey silt loam, 2 to 5 percent slopes, a cropping system that controls runoff and erosion is needed, in combination with other erosion control practices. As used here, cropping system refers to the sequence of crops grown, in combination with management that includes minimum tillage, mulch planting, use of crop residue, growing cover crops and green-manure crops, and use of lime and fertilizer. Other erosion control practices are contour cultivation, terracing, contour stripcropping, diversion of runoff, and use of grassed waterways. The effectiveness of a particular combination of these measures differs from one soil to another, but different combinations can be equally effective on the same soil. The local representative of the Soil Conservation Service can assist in planning an effective combination of practices.

Pasture is effective in controlling erosion on all but a few of the erodible soils. A high level of pasture management is needed on some soils to provide enough ground cover to keep the soil from eroding. It provides for fertilization, control of grazing, selection of pasture mixtures, and other practices that are adequate for maintaining good ground cover and forage for grazing. Grazing is controlled by rotating livestock from one pasture to another and providing rest periods for the pasture after each grazing period to allow for regrowth of the plants. It is important on some soils that pasture mixtures be selected that require the least amount of renovation to maintain good ground cover and forage for grazing.

Capability Grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The groups are made according to the limitations of the soils when used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops requiring special management.

In the capability system, all kinds of soils are grouped at three levels: the capability class, the subclass, and the unit. These levels are defined in the following paragraphs.

CAPABILITY CLASSES, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use, defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both.

Class V soils are not likely to erode, but have other limitations, impractical to remove, that limit their use largely to pasture or range, woodland, or wildlife. (None in Monroe County.)

Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife.

Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland, or wildlife.

Class VIII soils and landforms have limitations that preclude their use for commercial crop production and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes. (None in Monroe County.)

CAPABILITY SUBCLASSES are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, but not in Monroe County, shows the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by *w*, *s*, and *c*, because the soils in class V are subject to little or no erosion, although they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation.

CAPABILITY UNITS are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-1 or IIIe-2. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass. The capability unit is designated at the end of each mapping unit in the section "Descriptions of the Soils."

Estimated Yields[2]

Table 5 lists estimated average acre yields of the principal crops grown in Monroe County under two levels of management. Predictions are based on estimates made by farmers, soil scientists, and others who have knowledge of yields in the county taken from research data. The yields in column A are those to be expected under prevailing or average management, and those in column B are yields to be expected under improved management.

Crops other than those shown in table 5 are grown in the county, but their predicted yields are not included because their acreage is small or reliable data on yields are not available.

Under high level management—

1. Rainfall is effectively used and conserved.
2. Surface or subsurface drainage systems, or both, are installed.
3. Crop residue is managed to maintain soil tilth.
4. Minimum but timely tillage is used.
5. Insect, disease, and weed control measures are consistently used.
6. Fertilizer is applied according to soil test and crop needs.
7. Adapted crop varieties are used at recommended seeding rates.

Woodland[3]

Originally, Monroe County was completely wooded. Woodland now covers about 70 percent of the county, 47 percent of which is the Cherokee National Forest.

Good stands of commercial trees are produced in the woodland. Needleleaf tree species occur most frequently on the ridges and steeper mountainsides, and broadleaf species generally are dominant in the coves and along the bottoms of rivers and creeks.

The value of the wood products is substantial, but is below the potential. Other values include wildlife, recreation, natural beauty, and conservation of soil and water. This section has been provided to explain how soils affect tree growth and management in the county. In table 6 potential productivity and management problems of the soils are listed.

In the first column, the soils are listed by their mapping unit symbols under the series name. If a mapping unit contains the name of two series, for example, a complex or an association, the component soils are listed and evaluated separately under each series name.

---

[2] C. H. JENT, agronomist, Soil Conservation Service, helped to prepare this section.

[3] C. M. HENNINGER, forester, Soil Conservation Service, helped to prepare this section.

TABLE 5.—*Estimated average acre yields of the principal crops under two levels of management*

[Figures in column A are yields obtained under common management; those in column B are yields to be expected under highest feasible management. Absence of figure indicates that the crop is not commonly grown. Only arable soils are listed]

Soil	Corn		Tobacco		Alfalfa		Wheat		Soybeans		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B
	Bu	*Bu*	*Lbs*	*Lbs*	*Tons*	*Tons*	*Bu*	*Bu*	*Bu*	*Bu*	*Cow-acre-days*[1]	*Cow-acre-days*
Alcoa loam, 2 to 5 percent slopes	55	80	1,900	2,300	2.8	3.4	34	46	22	30	135	195
Alcoa loam, 5 to 12 percent slopes	50	72	1,700	2,000	2.8	3.2	34	44	22	28	125	180
Alcoa loam, 12 to 20 percent slopes	40	65	1,500	1,800	2.6	3.0	25	40	16	22	115	170
Alcoa clay loam, 5 to 12 percent slopes, severely eroded	30	45	1,300	1,600	1.8	2.4	25	32	14	20	65	115
Alcoa clay loam, 12 to 20 percent slopes, severely eroded					1.2	1.7	18	28			60	105
Allegheny loam	70	110	2,000	2,300	2.8	3.4	40	48	30	38	145	210
Allen loam, 5 to 12 percent slopes	50	75	1,700	2,200	2.4	3.3	32	45	20	30	115	195
Allen loam, 12 to 25 percent slopes	40	65	1,600	2,000	1.7	3.0	26	40			90	150
Altavista silt loam	52	85	1,500	1,700			25	35	25	38	140	210
Atkins silt loam	25	45							18	30	80	165
Beason silt loam	35	60					21	30	24	35	100	190
Bland silt loam, 10 to 25 percent slopes											75	135
Bland silt loam, 25 to 50 percent slopes											60	115
Calvin silt loam, 5 to 20 percent slopes					1.0	1.6	16	26			65	100
Calvin silt loam, 20 to 40 percent slopes											60	90
Chagrin silt loam	75	110	2,000	2,200	2.2	3.0	32	45	26	38	160	220
Christian loam, 3 to 12 percent slopes	38	65	1,300	1,700	2.0	3.0	30	42			90	180
Christian loam, 12 to 25 percent slopes					1.5	2.6	20	38			85	160
Christian clay loam, 12 to 25 percent slopes, severely eroded											65	110
Dandridge shaly silty clay loam, 5 to 20 percent slopes					.8	1.5	18	25			60	120
Dandridge shaly silty clay loam, 20 to 35 percent slopes											60	115
Decatur silt loam, 2 to 5 percent slopes	60	80	1,750	2,000	2.6	3.7	33	48	22	30	130	195
Decatur silt loam, 5 to 12 percent slopes	50	72	1,650	1,900	2.6	3.5	33	48	19	27	125	180
Decatur silt loam, 12 to 20 percent slopes, eroded	40	65	1,300	1,700	2.2	3.0	29	42	16	24	115	170
Decatur silty clay loam, 5 to 12 percent slopes, severely eroded	30	45	1,150	1,350	2.1	2.7	24	35	12	18	85	130
Decatur silty clay loam, 12 to 20 percent slopes, severely eroded	26	40	1,000	1,250	2.0	2.5	23	33			80	125
Dewey silt loam, 2 to 5 percent slopes	54	78	1,650	1,900	2.6	3.7	32	48	22	30	125	185
Dewey silt loam, 5 to 12 percent slopes	52	68	1,500	1,800	2.6	3.5	32	46	19	27	120	175
Dewey silt loam, 12 to 20 percent slopes, eroded	40	60	1,300	1,600	2.2	3.2	28	42			110	165
Dewey silty clay loam, 5 to 12 percent slopes, severely eroded	28	42	1,000	1,300	2.1	2.7	24	35			80	125
Dewey silty clay loam, 12 to 20 percent slopes, severely eroded	28	38	900	1,200	2.0	2.6	23	33			75	120
Dunmore silt loam, 2 to 5 percent slopes	52	72	1,700	2,000	2.6	3.7	32	48	22	30	120	175
Dunmore silt loam, 5 to 12 percent slopes	50	65	1,600	1,900	2.6	3.6	32	46	19	27	120	170
Dunmore silt loam, 12 to 20 percent slopes, eroded	40	58	1,400	1,700	2.2	3.0	28	42			110	165
Dunmore silt loam, 20 to 35 percent slopes, eroded											100	150
Dunmore silty clay loam, 5 to 12 percent slopes, severely eroded	27	40	1,000	1,400	2.1	2.7	24	35			80	125
Dunmore silty clay loam, 12 to 20 percent slopes, severely eroded					2.0	2.6	23	33			75	120
Dunning silty clay loam	35	55							22	35	115	170
Emory silt loam	70	115	2,000	2,300	2.4	3.3	33	44	27	38	150	210
Etowah silt loam, 2 to 5 percent slopes	70	100	2,000	2,300	2.4	3.5	33	48	28	40	150	210
Etowah silt loam, 5 to 12 percent slopes	58	85	1,800	2,200	2.4	3.4	33	46	26	36	145	200
Etowah silt loam, 12 to 20 percent slopes	55	80	1,600	1,900	2.2	3.1	30	43	23	33	130	190
Farragut silt loam, 5 to 12 percent slopes, eroded	45	65	1,400	1,700	2.3	3.4	32	45	20	28	130	190
Farragut silty clay, 12 to 20 percent slopes, severely eroded					1.4	2.1	23	30			70	110
Fletcher silt loam, 5 to 12 percent slopes	48	68	1,700	2,000	2.0	3.0	32	48	20	32	120	180
Fletcher silt loam, 12 to 20 percent slopes	40	62	1,500	1,800	2.0	2.8	32	42			110	165

Fullerton cherty silt loam, 5 to 12 percent slopes	40	65	1,600	1,850	2.0	2.8	30	42			100	160
Fullerton cherty silt loam, 12 to 20 percent slopes	35	52	1,400	1,650	1.9	2.4	25	38			80	140
Fullerton cherty silt loam, 20 to 40 percent slopes											65	100
Gladeville-Rock outcrop complex, 5 to 25 percent slopes											20	40
Greendale silt loam	70	110	1,900	2,300	2.0	2.8	30	45	38	40	150	220
Hamblen silt loam	65	100	1,200	1,700			30	35	28	38	150	220
Hartsells fine sandy loam, 5 to 15 percent slopes	55	70	1,400	1,700	1.8	2.8	27	44			100	175
Holston loam, 3 to 12 percent slopes	55	90	1,800	2,200	1.9	2.9	32	47	25	33	125	190
Jefferson fine sandy loam, 3 to 12 percent slopes	50	75	1,700	2,100	1.9	2.7	28	45	18	28	115	175
Jefferson fine sandy loam, 12 to 25 percent slopes											95	150
Jefferson cobbly fine sandy loam, 12 to 25 percent slopes											70	130
Leadvale silt loam, 2 to 5 percent slopes	48	75	1,600	1,900	1.5	2.3	28	44	23	32	120	180
Linker loam, 5 to 12 percent slopes	47	70	1,600	1,900	1.8	2.8	28	47	20	28	115	180
Litz shaly silt loam, 5 to 12 percent slopes			1,300	1,500	1.0	1.8	18	28			70	120
Litz shaly silt loam, 12 to 20 percent slopes					1.0	1.6	17	25			60	110
Litz shaly silt loam, 12 to 20 percent slopes, severely eroded											45	90
Litz shaly silt loam, 20 to 35 percent slopes											45	100
Lobdell silt loam	65	100					30	35	28	38	150	220
Minvale silt loam, 2 to 5 percent slopes	60	90	1,100	2,300	2.2	3.4	30	45	21	30	130	200
Minvale silt loam, 5 to 12 percent slopes	55	82	1,700	2,200	2.1	3.3	30	44	20	28	130	190
Montevallo shaly silt loam, 12 to 30 percent slopes											55	90
Neubert loam	65	95	1,800	2,000	2.0	2.8	27	40	23	35	140	210
Newark silt loam	40	60							18	30	125	195
Philo silt loam	60	90	1,400	1,700			25	35	23	35	135	200
Pope loam	70	100	2,000	2,200	2.0	3.0	30	42	26	40	125	215
Purdy silt loam									14	25	95	165
Ranger channery silt loam, 12 to 25 percent slopes											60	110
Sequatchie loam	65	105	2,100	2,300	2.0	2.9	33	48	27	38	155	220
Sequoia silt loam, 2 to 5 percent slopes	42	64	1,550	1,750	2.0	3.0	30	44	17	26	110	180
Sequoia silt loam, 5 to 12 percent slopes, eroded	37	54	1,400	1,575	2.0	2.7	30	42	15	22	100	165
Sequoia silt loam, 12 to 20 percent slopes, eroded					1.8	2.6	26	38			100	150
Sequoia silty clay, 5 to 12 percent slopes, severely eroded					1.4	2.0	23	30			80	120
Sequoia silty clay, 12 to 20 percent slopes, severely eroded					1.4	1.9	18	27			75	110
Shelocta silt loam, 3 to 12 percent slopes	60	90	1,900	2,200	2.4	3.2	32	48	22	32	130	190
Shelocta silt loam, 12 to 25 percent slopes	45	80	1,800	2,000	2.2	3.0	28	42			120	180
Staser loam	75	115	2,000	2,300	2.5	3.5	32	44	30	40	160	225
Statler loam	75	110	2,100	2,300	2.5	3.5	32	48	28	40	150	215
Talbott silt loam, 5 to 12 percent slopes, eroded	30	45	1,300	1,600	1.8	2.5	27	42	17	23	90	140
Talbott silt loam, 12 to 20 percent slopes, eroded					1.7	2.3	23	38			75	120
Talbott clay, 5 to 12 percent slopes, severely eroded					1.2	1.8	18	32			60	100
Talbott clay, 12 to 20 percent slopes, severely eroded					1.0	1.7					55	80
Talbott-Rock outcrop complex, 5 to 20 percent slopes											50	70
Talbott-Rock outcrop complex, 20 to 40 percent slopes											35	55
Tellico loam, 12 to 20 percent slopes	35	50	1,400	1,700	2.0	2.7	25	35			90	145
Tellico clay loam, 12 to 20 percent slopes, severely eroded					1.5	2.0	21	28			50	95
Transylvania loam	100	115	2,200	2,300	3.0	3.5	35	45	35	40	150	225
Waynesboro loam, 2 to 5 percent slopes	60	85	1,800	2,100	2.6	3.5	36	35	26	35	130	195
Waynesboro loam, 5 to 12 percent slopes	55	80	1,700	2,000	2.6	3.4	36	45	21	30	130	180
Waynesboro loam, 12 to 20 percent slopes	40	70	1,300	1,700	2.5	3.2	33	40	18	28	110	165
Waynesboro loam, 20 to 35 percent slopes											100	140
Waynesboro clay loam, 5 to 12 percent slopes, severely eroded	42	55	1,400	1,500	2.0	2.8	24	36	14	19	100	150
Waynesboro clay loam, 12 to 20 percent slopes, severely eroded											90	140
Whitwell loam	55	90	1,700	1,800	1.8	2.3	28	40	25	35	130	200

---

[1] Cow-acre-days is a term used to express the carrying capacity of pasture. It is the number of days in the grazing season that 1 acre will provide grazing for one cow, steer, or horse; five hogs; or seven sheep or goats without injury to the pasture. To determine the tonnage of air-dry forage per acre, divide the number of cow-acre-days by 53.

TABLE 6.—*Potential woodland productivity and factors in management*

Soil series and map symbols	Woodland suitability group	Management problems					Potential productivity		Trees suitable for planting
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Important trees	Site index	
Alcoa:									
AaB, AaC, AaD	3o7	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar	90	Yellow-poplar, black walnut, loblolly pine, white pine, shortleaf pine.
							Southern red oak	70	
							Shortleaf pine	70	
							White pine	80	
							Loblolly pine	80	
AcC3, AcD3	3o7	Moderate	Severe	Moderate	Slight	Slight	Shortleaf pine	60	Loblolly pine, Virginia pine, white pine, shortleaf pine.
							Virginia pine	60	
							Loblolly pine	70	
							White pine	70	
Allegheny: Ag	2o7	Slight	Slight	Slight	Slight	Severe	Yellow-poplar	100	Yellow-poplar, black walnut, white pine.
							Northern red oak	80	
							White pine	90	
							Black walnut		
							Sugar maple		
Allen: AnC, AnD	3o7	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar	90	Yellow-poplar, black walnut, shortleaf pine, white pine, loblolly pine.
							Southern red oak	70	
							Shortleaf pine	70	
							Loblolly pine	80	
							Eastern redcedar	60	
Altavista: As	2w8	Slight	Moderate	Moderate	Slight	Severe	Yellow-poplar	95	Loblolly pine, white pine, sweetgum.
							Southern red oak	75	
							Sweetgum	90	
							Loblolly pine	90	
							White pine	90	
Atkins: At	2w9	Slight	Severe	Severe	Slight	Severe	Loblolly pine	90	Loblolly pine, white pine.
							White pine	90	
							Sweetgum	90	
							Southern red oak	70	
							Sycamore		
Beason: Ba	3w8	Slight	Moderate	Slight	Slight	Moderate	Yellow-poplar	90	Loblolly pine, sweetgum.
							Sweetgum	80	
							Loblolly pine	80	
							Southern red oak	70	
							White oak	70	
Bland:									
BdD	3c2	Slight	Moderate	Slight	Slight	Moderate	Loblolly pine	80	Loblolly pine, Virginia pine, Eastern redcedar.
							Shortleaf pine	70	
							Virginia pine	70	
							Eastern redcedar	50	
							Southern red oak	70	
BdE	3c3	Moderate	Severe	Slight	Slight	Moderate	Loblolly pine	80	Loblolly pine, Virginia pine, Eastern redcedar.
							Shortleaf pine	70	
							Virginia pine	70	
							Eastern redcedar	50	
							Southern red oak	70	
BnE	4x3	Moderate	Severe	Moderate	Slight	Slight	Shortleaf pine	60	Virginia pine, Eastern redcedar.
							Virginia pine	60	
							Eastern redcedar	40	

Brookshire: BrE	2r8	Moderate	Moderate	Slight	Slight	Severe	Yellow-poplar	100	Yellow-poplar, white pine.
							Northern red oak	80	
							White pine	90	
							Yellow birch		
							Sugar maple		
Calvin: CaD, CaE	4f3	Moderate	Moderate	Severe	Slight	Slight	Southern red oak	60	Loblolly pine, shortleaf pine, Virginia pine, white pine.
							Shortleaf pine	60	
							Virginia pine	60	
							White pine	70	
							Loblolly pine	70	
Cataska: CcF	5f3	Moderate	Moderate	Severe	Slight	Slight	Chestnut oak	50	Pitch pine.
							Scarlet oak	50	
							Pitch pine	50	
							Virginia pine	50	
Chagrin: Cg	2o7	Slight	Slight	Slight	Slight	Severe	Yellow-poplar	100	Yellow-poplar, black walnut, white pine loblolly pine.
							Northern red oak	80	
							Black cherry		
							Black walnut		
							White ash		
Christian: ChC, ChD	3o7	Slight	Slight	Slight	Slight	Moderate	Shortleaf pine	70	Loblolly pine, shortleaf pine, white pine.
							Southern red oak	70	
							Virginia pine	70	
							Loblolly pine	80	
							White pine	80	
CnD3	4c3e	Slight	Moderate	Moderate	Slight	Slight	Loblolly pine	70	Loblolly pine, Virginia pine.
							Virginia pine	60	
Citico: CtE	2r8	Moderate	Moderate	Slight	Slight	Severe	Yellow-poplar	100	Yellow-poplar, white pine.
							Northern red oak	80	
							White pine	90	
							Black walnut		
							Sugar maple		
Dandridge: DaD	4d2	Slight	Moderate	Moderate	Moderate	Slight	Southern red oak	60	Virginia pine, Eastern redcedar.
							Virginia pine	55	
							Eastern redcedar	40	
							White pine	70	
DaE, DaF	4d3	Moderate	Severe	Moderate	Moderate	Slight	Southern red oak	60	Virginia pine, Eastern redcedar.
							Virginia pine	55	
							Eastern redcedar	40	
							White pine	70	
Decatur: DcB, DcC, DcD2	3o7	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar	90	Yellow-poplar, black walnut, white pine, loblolly pine.
							Southern red oak	70	
							Shortleaf pine	70	
							Black walnut		
DdC3, DdD3	4c3e	Moderate	Moderate	Moderate	Slight	Slight	Loblolly pine	70	Loblolly pine, Eastern redcedar, white pine.
							Virginia pine	60	
							White pine	70	
							Eastern redcedar	40	
Dewey: DeB, DeC, DeD2	3o7	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar	90	Yellow-poplar, black walnut, white pine, loblolly pine.
							Southern red oak	70	
							Shortleaf pine	70	
							White pine	80	
							Black walnut		

TABLE 6.—*Potential woodland productivity and factors in management*—Continued

Soil series and map symbols	Woodland suitability group	Management problems					Potential productivity		Trees suitable for planting
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Important trees	Site index	
Dewey: (Cont.) DgC3, DgD3	4c3e	Moderate	Moderate	Moderate	Slight	Slight	Loblolly pine Virginia pine White pine Eastern redcedar	70 60 70 40	Loblolly pine, Eastern redcedar, white pine.
Ditney: DhD, DhF	4r3	Moderate	Severe	Slight	Slight	Slight	Shortleaf pine Virginia pine White oak White pine	60 60 60 70	Shortleaf pine, white pine, Virginia pine.
Dunmore: DmB, DmC, DmD2	3o7	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar Eastern redcedar Shortleaf pine White pine Black walnut	90 70 70 80	Yellow-poplar, black walnut, shortleaf pine, white pine.
DmE2	3r8	Moderate	Moderate	Slight	Slight	Moderate	Yellow-poplar Eastern redcedar Shortleaf pine White pine Black walnut	90 70 70 80	Yellow-poplar, black walnut, shortleaf pine, white pine.
DnC3, DnD3	4c3e	Slight	Severe	Moderate	Slight	Slight	Virginia pine White pine Eastern redcedar Loblolly pine	60 70 40 70	Loblolly pine, Virginia pine, white pine, Eastern redcedar.
Dunning: Du	2w9	Slight	Severe	Severe	Slight	Severe	Sweetgum Willow oak Loblolly pine Cottonwood Green ash	90 90 90 100	Loblolly pine, cottonwood, sweetgum.
Emory: Em	2o7	Slight	Slight	Slight	Slight	Severe	Yellow-poplar Northern red oak Loblolly pine White pine Black walnut	100 80 90 90	Yellow-poplar, black walnut, loblolly pine, white pine.
Etowah: EtB, EtC, EtD.	2o7	Slight	Slight	Slight	Slight	Severe	Yellow-poplar Northern red oak Loblolly pine White pine Black walnut	100 80 90 90	Yellow-poplar, black walnut, loblolly pine, white pine.
Farragut: FaC2	3o7	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar Southern red oak Shortleaf pine White pine	90 70 70 80	Yellow-poplar, black walnut, shortleaf pine, white pine.
FgD3	4c3e	Moderate	Moderate	Severe	Slight	Slight	Loblolly pine Virginia pine White pine Eastern redcedar	70 60 70 40	Loblolly pine, Virginia pine, white pine, Eastern redcedar.

Fletcher: FhC, FhD	2o7	Slight	Slight	Slight	Slight	Severe	White pine	90	White pine, shortleaf pine, yellow-poplar.
							Shortleaf pine	70	
							Virginia pine	75	
							Loblolly pine	85	
							Yellow-poplar	95	
Fullerton: FtC, FtD	3o7	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar	90	Yellow-poplar, black walnut, loblolly pine, shortleaf pine, white pine.
							Southern red oak	70	
							Shortleaf pine	70	
							Loblolly pine	80	
							White pine	80	
FtE	3r8	Moderate	Moderate	Slight	Slight	Moderate	Yellow-poplar	90	Yellow-poplar, black walnut, loblolly pine, shortleaf pine, white pine.
							Southern red oak	70	
							Shortleaf pine	70	
							Loblolly pine	80	
							White pine	80	
Gladeville: GdD	5x3	Slight	Severe	Severe	Slight	Slight	Virginia pine	50	Eastern redcedar, Virginia pine.
							Eastern redcedar	35	
Greendale: Gr	2o7	Slight	Slight	Slight	Slight	Severe	Yellow-poplar	100	Yellow-poplar, black walnut, loblolly pine, shortleaf pine, white pine.
							Northern red oak	80	
							Shortleaf pine	80	
							Loblolly pine	90	
							Black walnut		
Hamblen: Ha	2w8	Slight	Moderate	Slight	Slight	Severe	Yellow-poplar	100	Yellow-poplar, loblolly pine, white pine.
							Southern red oak	80	
							Loblolly pine	90	
Hartsells: HeC	4o1	Slight	Slight	Slight	Slight	Slight	Shortleaf pine	60	Shortleaf pine, Virginia pine, white pine, loblolly pine.
							Virginia pine	60	
							Loblolly pine	70	
							White pine	70	
							Black oak	60	
Holston: HoC	3o7	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar	90	Yellow-poplar, black walnut, loblolly pine, shortleaf pine, white pine.
							Southern red oak	70	
							Shortleaf pine	70	
							Loblolly pine	80	
							Virginia pine	70	
Jefferson: JeC, JeD	3o7	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar	90	Yellow-poplar, black walnut, shortleaf pine, loblolly pine, white pine.
							Southern red oak	70	
							Shortleaf pine	70	
							Loblolly pine	80	
							Black walnut		
JeE	3r8	Moderate	Moderate	Slight	Slight	Moderate	Yellow-poplar	90	Yellow-poplar, black walnut, shortleaf pine, loblolly pine, white pine.
							Southern red oak	70	
							Shortleaf pine	70	
							Loblolly pine	80	
							Black walnut		
JfD, JfE	3x8	Moderate	Moderate	Slight	Slight	Moderate	Yellow-poplar	90	Yellow-poplar, black walnut, shortleaf pine, loblolly pine, white pine.
							Southern red oak	70	
							Shortleaf pine	70	
							Loblolly pine	80	
							Black walnut		
Jeffrey: JyD, JyF	4x9	Moderate	Severe	Moderate	Slight	Slight	Yellow-poplar	80	White pine.
							White pine	70	
							Southern red oak	60	

TABLE 6.—*Potential woodland productivity and factors in management*—Continued

Soil series and map symbols	Woodland suitability group	Management problems					Potential productivity		Trees suitable for planting
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Important trees	Site index	
Leadvale: LeB	3o7	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar Southern red oak Shortleaf pine Loblolly pine	90 70 70 80	Loblolly pine, shortleaf pine, Virginia pine.
Linker: LkC	4o1	Slight	Slight	Slight	Slight	Slight	Shortleaf pine Virginia pine Loblolly pine White pine Black oak	60 60 70 70 60	Shortleaf pine, Virginia pine, white pine, loblolly pine.
Litz:									
LtC, LtD, LtE	3f8	Moderate	Moderate	Moderate	Slight	Moderate	Yellow-poplar Southern red oak Shortleaf pine Virginia pine White pine	80 70 70 70 80	Shortleaf pine, Virginia pine, white pine, loblolly pine.
LtD3	4c3e	Moderate	Moderate	Severe	Slight	Slight	Shortleaf pine Virginia pine White pine Loblolly pine	60 60 70 70	Virginia pine, loblolly pine, white pine.
LY	4c3e	Moderate	Moderate	Severe	Slight	Slight	Shortleaf pine Virginia pine White pine Loblolly pine	60 60 70 70	Virginia pine, loblolly pine, white pine.
Lobdell: Lz	2w8	Slight	Moderate	Slight	Slight	Severe	Yellow-poplar Loblolly pine Shortleaf pine White pine Southern red oak	95 90 75 90 80	Yellow-poplar, loblolly pine, white pine.
Minvale: MnB, MnC	3o7	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar Southern red oak Shortleaf pine Loblolly pine Black walnut	90 70 70 80 	Yellow-poplar, black walnut, shortleaf pine, loblolly pine, white pine.
Montevallo: MtE	4d3	Moderate	Moderate	Severe	Moderate	Slight	Shortleaf pine Virginia pine White pine Loblolly pine Southern red oak	60 60 70 70 60	Loblolly pine, shortleaf pine, Virginia pine, white pine.
Neubert: Ne	2o7	Slight	Slight	Slight	Slight	Severe	Yellow-poplar White pine Shortleaf pine Northern red oak Black walnut	100 90 80 80 	Yellow-poplar, black walnut, white pine, loblolly pine, shortleaf pine.
Newark: Nk	2w8	Slight	Moderate	Slight	Slight	Severe	Willow oak Sweetgum Loblolly pine Green ash	90 90 90 	Loblolly pine, sweetgum, cottonwood.

Philo: Ph	2w8	Slight	Moderate	Slight	Slight	Severe	Yellow-poplar	90	Yellow-poplar, loblolly pine, white pine, cottonwood.
							Sweetgum	80	
							Loblolly pine	80	
							White pine	80	
Pope: Po	2o7	Slight	Slight	Slight	Slight	Severe	Yellow-poplar	100	Yellow-poplar, black walnut, loblolly pine, white pine.
							Northern red oak	80	
							White pine	90	
							Loblolly pine	90	
							Black walnut		
Purdy: Pu	2w9	Slight	Severe	Severe	Slight	Severe	Willow oak	90	Loblolly pine, sweetgum.
							Sweetgum	90	
							Loblolly pine	90	
							Green ash		
Ramsey: RaF	5x3	Moderate	Severe	Moderate	Moderate	Slight	Chestnut oak	50	Shortleaf pine, Virginia pine, loblolly pine, white pine.
							Shortleaf pine	50	
							Virginia pine	50	
							Loblolly pine	60	
							White pine	60	
Ranger:									
RgD	3f8	Moderate	Moderate	Moderate	Slight	Moderate	Shortleaf pine	70	Shortleaf pine, Virginia pine, white pine.
							Chestnut oak	70	
							Virginia pine	70	
							White pine	80	
RgF	3f9	Moderate	Severe	Moderate	Slight	Moderate	Shortleaf pine	70	Shortleaf pine, Virginia pine, white pine.
							Chestnut oak	70	
							Virginia pine	70	
							White pine	80	
Sequatchie: Sa	2o7	Slight	Slight	Slight	Slight	Severe	Yellow-poplar	100	Yellow-poplar, black walnut, loblolly pine, white pine.
							Northern red oak	80	
							Loblolly pine	90	
							Black walnut		
							White ash		
Sequoia:									
SeB, SeC2, SeD2	3o7	Slight	Slight	Slight	Slight	Moderate	Southern red oak	70	Loblolly pine, shortleaf pine, Virginia pine, white pine.
							Shortleaf pine	70	
							Virginia pine	70	
							Loblolly pine	80	
							White pine	80	
SgC3, SgD3	4c3e	Slight	Moderate	Severe	Slight	Slight	Loblolly pine	70	Loblolly pine, Virginia pine, Eastern redcedar.
							Shortleaf pine	55	
							Virginia pine	60	
							Eastern redcedar	40	
Shelocta: ShC, ShD	3o7	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar	90	Yellow-poplar, black walnut, shortleaf pine, loblolly pine, white pine.
							Southern red oak	70	
							Shortleaf pine	70	
							White pine	80	
							Black walnut		
Shouns: SnD	3o7	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar	90	Yellow-poplar, black walnut, shortleaf pine, white pine, loblolly pine.
							Southern red oak	70	
							Shortleaf pine	70	
							White pine	80	
							Black walnut		
Spivey: SpF	2x9	Moderate	Severe	Moderate	Slight	Severe	Yellow-poplar	100	Too stony to plant.
							Northern red oak	80	
							White pine	90	
							Basswood		
							Hemlock		

TABLE 6.—*Potential woodland productivity and factors in management*—Continued

Soil series and map symbols	Woodland suitability group	Management problems					Potential productivity		Trees suitable for planting
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Important trees	Site index	
Staser: Ss	2o7	Slight	Slight	Slight	Slight	Severe	Yellow-poplar Northern red oak White pine Loblolly pine Black walnut	100 80 90 90 	Yellow-poplar, black walnut, loblolly pine, white pine.
Statler: St	2o7	Slight	Slight	Slight	Slight	Severe	Yellow-poplar Northern red oak White pine Loblolly pine Black walnut	100 80 90 90 	Yellow-poplar, black walnut, loblolly pine, white pine.
Steekee: SvF	4d3	Moderate	Moderate	Moderate	Moderate	Slight	Shortleaf pine Virginia pine Southern red oak White pine	60 60 60 70	Shortleaf pine, Virginia pine, white pine.
Sylco: SyF	4r3	Moderate	Severe	Slight	Slight	Slight	Shortleaf pine Virginia pine Southern red oak White pine	60 60 60 70	Shortleaf pine, Virginia pine, white pine.
Talbott:									
TaC2, TaD2	3c2	Slight	Moderate	Moderate	Slight	Moderate	Southern red oak Loblolly pine Shortleaf pine Virginia pine Eastern redcedar	65 80 65 70 45	Loblolly pine, Virginia pine, shortleaf pine, Eastern redcedar.
TbC3, TbD3	4c3e	Slight	Moderate	Severe	Slight	Slight	Loblolly pine Virginia pine Eastern redcedar	70 60 40	Loblolly pine, Virginia pine, Eastern redcedar.
TcD, TcE	4x3	Slight	Severe	Severe	Slight	Slight	Loblolly pine Virginia pine Shortleaf pine Eastern redcedar	70 60 60 45	Virginia pine, Eastern redcedar.
Tellico:									
TeD	3o7	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar Northern red oak Shortleaf pine White pine	90 70 70 80	Shortleaf pine, Virginia pine, loblolly pine, white pine.
TeE, TeF	3r8	Moderate	Severe	Slight	Slight	Moderate	Yellow-poplar Northern red oak Shortleaf pine White pine	90 70 70 80	Shortleaf pine, Virginia pine, loblolly pine, white pine.
ToD3, ToE3	4c3e	Moderate	Severe	Moderate	Slight	Slight	Shortleaf pine Virginia pine White pine Loblolly pine	60 60 70 70	Virginia pine, loblolly pine, white pine.
TS	4c3e	Moderate	Severe	Moderate	Slight	Slight	Shortleaf pine Virginia pine White pine Loblolly pine Eastern redcedar	60 60 70 70 40	Virginia pine, loblolly pine, white pine, Eastern redcedar.

Transylvania: Ty	2o7	Slight	Slight	Slight	Slight	Severe	Yellow-poplar Northern red oak White pine Loblolly pine Black walnut	100 80 90 90 	Yellow-poplar, black walnut, white pine, loblolly pine, shortleaf pine.
Unicoi: UcF	5x3	Slight	Severe	Severe	Moderate	Slight	Pitch pine Chestnut oak Scarlet oak Virginia pine	50 50 50 50	Too stony to plant.
Wallen: WaF	4f3	Moderate	Severe	Moderate	Slight	Slight	Black oak Virginia pine Shortleaf pine	60 60 60	Virginia pine, shortleaf pine.
Waynesboro:									
WbB, WbC, WbD	3o7	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar Southern red oak Shortleaf pine Virginia pine Black walnut	90 75 70 75 	Yellow-poplar, black walnut, shortleaf pine, loblolly pine, white pine.
WbE	3r8	Moderate	Moderate	Slight	Slight	Moderate	Yellow-poplar Southern red oak Shortleaf pine Virginia pine Black walnut	90 75 70 75 	Yellow-poplar, black walnut, shortleaf pine, loblolly pine, white pine.
WnC3, WnD3	4c3e	Slight	Severe	Moderate	Slight	Slight	Loblolly pine Shortleaf pine Virginia pine White pine	70 60 65 70	Virginia pine, loblolly pine, white pine.
Whitwell: Wt	2w8	Slight	Moderate	Moderate	Slight	Severe	Yellow-poplar Northern red oak Sweetgum Loblolly pine White pine	95 75 90 90 90	Loblolly pine, sweetgum, white pine.

The second column shows the woodland suitability symbol. Each woodland suitability group is identified by a three-part symbol. The first part of the symbol indicates the relative productivity of the soils: The numeral 1 means very high: 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the important soil property that imposes a moderate or severe hazard or limitation in managing the soils for wood production. The letter *x* indicates stoniness or rockiness; *w,* excessive water in or on the soil; *d,* the rooting depth is restricted; *c,* clay in the upper part of the soil; *f,* large amounts of coarse fragments; and *r,* steep slopes. The letter *o* indicates no significant restrictions or limitations for woodland use or management. If the soil has more than one limiting characteristic, priority is in the order explained.

The third element in the symbol indicates the degree of hazard or limitation and the general suitability of the soils for certain kinds of trees. The three management concerns considered are erosion hazard, equipment restrictions, and seedling mortality.

The numeral 1 indicates that limitations are no more than slight and the soils are best suited to pines.

The numeral 2 indicates that limitations are moderate and the soils are best suited to pines.

The numeral 3 indicates that limitations are severe and the soils are best suited to pines.

The numeral 4 indicates that limitations are no more than slight and the soils are best suited to hardwoods.

The numeral 5 indicates that limitations are moderate and the soils are best suited to hardwoods.

The numeral 6 indicates that limitations are severe and the soils are best suited to hardwoods.

The numeral 7 indicates that limitations are no more than slight and the soils are suited to either pines or hardwoods.

The numeral 8 indicates that limitations are moderate and the soils are suited to either pines or hardwoods.

The numeral 9 indicates that limitations are severe and the soils are suited to either pines or hardwoods.

The numeral 0 indicates that limitations are very severe and the soils are not suited to the production of commercial wood crops.

The woodland suitability group to which each mapping unit is assigned is specified at the end of each unit description under "Descriptions of the Soils."

The management problems evaluated in table 6 are erosion hazard, equipment limitation, seedling mortality, windthrow hazard, and plant competition. Limitations are expressed as slight, moderate, and severe.

Erosion hazard measures the risk of soil loss in well-managed woodland. The hazard is *slight* if expected soil loss is small, *moderate* if some measures to control erosion are needed in logging and construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive soil loss.

Equipment limitation relates to soil conditions that restrict the use of equipment normally used in woodland management or harvest. *Slight* indicates no limitation on the kind of equipment or the time of year. *Moderate* indicates a seasonal limitation or need for modification in methods or equipment. *Severe* indicates the need for specialized equipment or operation.

Seedling mortality indicates the degree of expected mortality of planted seedlings when plant competition is not a limiting factor. Normal rainfall, good planting stock, and proper planting are assumed. *Slight* indicates that expected mortality is less than 25 percent; *moderate,* 25 to 50 percent; and *severe,* more than 50 percent.

Windthrow hazard relates to the danger of trees being blown down by high-velocity winds. A rating of *slight* indicates that no special problem is recognized. *Moderate* indicates a problem during periods of excessive wetness and greatest wind velocity. *Severe* indicates that the soils do not provide adequate rooting stability.

Plant competition relates to growth of undesirable plants when openings are made in the canopy. A rating of *slight* indicates that competition does not prevent adequate natural regeneration and early growth or does not interfere with adequate development of planted seedlings. *Moderate* indicates that competition delays natural or artificial regeneration, but does not prevent the eventual development of fully stocked normal stands. *Severe* indicates that competition prevents adequate natural or artificial regeneration unless intensive site preparation and weeding are provided.

Listed in table 6 are some commercially important trees that are suited to the soil. These trees are to be favored in intermediate or improvement cuttings. Their potential productivity is expressed as site index. Site index is the average height of dominant trees, in feet, at age 30 for cottonwood; at age 35 for sycamore; at age 25 for planted pines; and at age 50 for all other species or types. Also listed in the table are trees suitable for planting for commercial wood production.

Wildlife[4]

The wildlife population of any area depends on the availability of food, cover, and water in a suitable combination. Habitat is created, improved, or maintained by establishing desirable vegetation and developing water supplies in suitable places.

Hunting and fishing are popular in Monroe County. More than two-thirds of the county is in forest, two-fifths of which is owned by the Forest Service. This mountainous area furnishes good cover, food, and water for large and small game, and clear, unpolluted streams for fish. People come from several states to join the managed hunts conducted by the Tennessee Wildlife Resource Agency and to fish for trout in the cool mountain streams.

The suitability of each soil in Monroe County for elements of wildlife habitat and kinds of wildlife is shown in table 7. These ratings refer only to the suitability of the soil and do not take into account the climate, the present use of the soil, or the distribution of wildlife and people. The suitability of individual sites has to be determined by onsite inspection.

---

[4] WILLIAM J. MELVEN, biologist, Soil Conservation Service, helped to prepare this section.

The information in this section can help in—

1. Planning the broad use of parks, refuges, nature study areas, and other recreational developments for wildlife.
2. Selecting the better soils for creating, improving, or maintaining specific kinds of wildlife habitat elements.
3. Determining the relative intensity of management needed for individual habitat elements.
4. Eliminating sites that would be difficult or not practical to manage for specific kinds of wildlife.
5. Determining areas that are suitable for acquisition for use by wildlife.

Habitat elements.—Each soil is rated in table 7 according to its suitability for various kinds of plants and other elements that make up wildlife habitat. The seven elements considered important are as follows:

Grain and seed crops are seed-producing annuals. Example are corn, sorghum, wheat, barley, oats, millet, buckwheat, cowpeas, and other plants commonly grown for grain or for seed. The major soil properties that affect this habitat element are effective rooting depth, available water capacity, natural drainage, slope, surface stoniness, hazard of flooding, and texture of the surface layer and subsoil.

Domestic grasses and legumes are domestic perennial grasses and herbaceous legumes that are established by planting to provide cover and food for wildlife. Among the plants are bluegrass, tall fescue, brome, timothy, orchardgrass, reed canarygrass, clover, and alfalfa. The major soil properties that affect this habitat element are effective rooting depth, available water capacity, natural drainage, slope, surface stoniness, hazard of flooding, and texture of the surface layer and subsoil.

Wild herbaceous plants are native or introduced perennial grasses and weeds that generally are established naturally. They include cheatgrass, beggarweed, tick clover, goldenrod, partridgepea, pokeberry, and dandelion. They provide food and cover mainly to upland forms of wildlife. The major soil properties that affect this habitat element are effective rooting depth, available water capacity, natural drainage, surface stoniness, hazard of flooding or ponding, and texture of the surface layer and subsoil.

Hardwood trees, shrubs, and woody vines produce nuts or other fruits, buds, catkins, twigs, or foliage that wildlife eat. They are generally established naturally, but can be planted. Among the native species are oak, cherry, maple, poplar, apple, hawthorn, dogwood, persimmon, sumac, sassafras, hazelnut, black walnut, hickory, sweetgum, blueberry, huckleberry, blackhaw, grape, and briers. The major soil properties that affect this habitat element are effective rooting depth, available water capacity, and natural drainage.

Also in this group are several varieties of fruit shrubs that are raised commercially for planting. Autumn-olive, Amur honeysuckle, Tartarian honeysuckle, crabapple, multiflora rose, and American holly are some of the shrubs that generally are available and can be planted on soils that are rated well suited. Hardwoods that are not available commercially can generally be transplanted successfully.

Coniferous plants are cone-bearing evergreen trees and shrubs that are used by wildlife, mainly as cover. They also provide browse and seeds or fruitlike cones for food. Among the trees included are Virginia pine, loblolly pine, shortleaf pine, and redcedar. Generally, the seedlings are established naturally in areas where cover of weeds and sod is thin, but they can also be planted. The major soil properties that affect this habitat element are effective rooting depth, available water capacity, and natural drainage.

Wetland plants are annual and perennial wild herbaceous plants, excluding the submerged or floating aquatics on moist and wet sites. They produce food and cover mostly for wetland wildlife. Examples are smartweed, wild millet, bulrush, sedges, barnyard grass, pondweed, duckweed, tearthumb, arrowarum, picklerelweed, waterwillow, wetland grasses, wildrice, and cattails. The major soil properties that affect this habitat element are natural drainage, surface stoniness, slope, and texture of the surface layer and subsoil.

Shallow water areas are stretches of shallow water, generally no more than 5 feet deep, near areas that provide food and cover for wetland wildlife. They may be naturally wet areas, or those created by dams or levees or by water-control devices in marshes or streams. Examples are wildlife ponds, beaver ponds, muskrat marshes, waterfowl feeding areas, and wildlife watering developments. The major soil properties that affect this habitat element are depth to bedrock, natural drainage, slope, surface stoniness, and permeability. Naturally wet areas that are aquifer fed are rated on the basis of drainage class without regard to permeability. Permeability of the soil applies only to those nonaquifer areas that have a potential for development. Water is assumed to be available offsite.

Kinds of wildlife habitat.—Table 7 rates the soils according to their suitability for supporting openland, woodland, and wetland wildlife habitat.

Openland wildlife are quail, pheasant, meadowlark, field sparrow, dove, cottontail rabbit, fox, and woodchuck. These birds and mammals generally inhabit areas of cropland, pasture, meadow, and lawns and areas overgrown with grasses, herbs, shrubs, and vines. For openland wildlife the rating is based on the ratings shown for grain and seed crops, domestic grasses and legumes, wild herbaceous upland plants, and either hardwood woody plants, or coniferous woody plants, whichever is most applicable.

Woodland wildlife are ruffed grouse, wild turkey, woodcock, thrush, vireo, gray and red squirrels, fox, raccoon, and white-tailed deer. They obtain food and cover in stands of hardwoods, coniferous trees, shrubs, or a mixture of these plants. The rating for woodland wildlife is based on the ratings listed for domestic grasses and legumes, wild herbaceous upland plants, and either hardwood woody plants or coniferous woody plants, whichever is most applicable.

Wetland wildlife are ducks, geese, rails, herons, shore birds, and muskrat. They normally inhabit wet areas,

TABLE 7.—*Suitability of soils for elements of wildlife habitat and kinds of wildlife*

Soil series and map symbols	Elements of wildlife habitat							Kinds of wildlife		
	Grain and seed crops	Domestic grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland	Woodland	Wetland
Alcoa:										
AaB	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
AaC, AcC3	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
AaD, AcD3	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
Allegheny: Ag	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Allen:										
AnC	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
AnD	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
Altavista: As	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Atkins: At	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Beason: Ba	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Bland:										
BdD	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
BdE	Very poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
BnE	Very poor	Poor	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor.
Brookshire: BrE	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
Calvin: CaD, CaE	Very poor	Fair	Good	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor.
Cataska: CcF	Very poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor.
Chagrin: Cg	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Christian:										
ChC	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
ChD, CnD3	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
Citico: CtE	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
Dandridge: DaD, DaE, DaF	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Very poor	Poor	Very poor	Very poor.
Decatur:										
DcB	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
DcC, DdC3	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
DcD2, DdD3	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
Dewey:										
DeB	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
DeC, DgC3	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
DeD2, DgD3	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
Ditney:										
DhD	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
DhF	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor.

Dunmore:										
DmB	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
DmC, DnC3	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
DmD2, DnD3	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
DmE2	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
Dunning: Du	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Emory: Em	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Etowah:										
EtB	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
EtC	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
EtD	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
Farragut:										
FaC2	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
FgD3	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
Fletcher:										
FhC	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
FhD	Poor	Fair	Good	Good	Poor	Very poor	Very poor	Good	Good	Very poor.
Fullerton:										
FtC	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
FtD	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
FtE	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
Gladeville: GdD	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor.
Greendale: Gr	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Hamblen: Ha	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Hartsells: HeC	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Holston: HoC	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Jefferson:										
JeC	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
JeD	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
JeE	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
JfD	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
JfE	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
Jeffrey:										
JyD	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
JyF	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
Leadvale: LeB	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Linker: LkC	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Litz:										
LtC	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
LtD, LtD3	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor.
LtE, LY	Very poor	Poor	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor.
Lobdell: Lz	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Minvale:										
MnB	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
MnC	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Montevallo: MtE	Poor	Poor	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor.

TABLE 7.—*Suitability of soils for elements of wildlife habitat and kinds of wildlife*—Continued

Soil series and map symbols	Elements of wildlife habitat							Kinds of wildlife		
	Grain and seed crops	Domestic grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland	Woodland	Wetland
Neubert: Ne	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Newark: Nk	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Philo: Ph	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Pope: Po	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Purdy: Pu	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Ramsey: RaF	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Very poor	Poor	Very poor	Very poor.
Ranger:										
RgD	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor.
RgF	Very poor	Very poor	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor.
Sequatchie: Sa	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Sequoia:										
SeB	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
SeC2, SgC3	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
SeD2, SgD3	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
Shelocta:										
ShC	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
ShD	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
Shouns: SnD	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
Spivey: SpF	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
Staser: Ss	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Statler: St	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Steekee: SvF	Very poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor.
Sylco: SyF	Very poor	Poor	Good	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor.
Talbott:										
TaC2, TbC3	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
TaD2, TbD3	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
TcD, TcE	Very poor	Poor	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor.
Tellico:										
TeD, ToD3	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
TeE, ToE3, TS	Very poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
TeF	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
Transylvania: Ty	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Unicoi: UcF	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Very poor	Poor	Very poor	Very poor.
Wallen: WaF	Very poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor.
Waynesboro:										
WbB	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
WbC, WnC3	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
WbD, WnD3	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
WbE	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
Whitwell: Wt	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.

such as ponds, marshes, and swamps. For wetland wildlife the rating is based on the ratings shown for wetland food and cover plants and shallow water areas.

Suitability ratings in table 7.—On soils rated *good,* habitat is generally easily created, improved, or maintained. There are few or no soil limitations in management, and satisfactory results can be expected.

On soils rated *fair,* habitat generally can be created, improved, or maintained, but moderate limitations affect management or development. A moderate intensity of management and fairly frequent attention may be required to insure satisfactory results.

On soils rated *poor,* habitat can generally be created, improved, or maintained, but limitations are severe. Management can be difficult and expensive and require intensive effort.

On soils rated *very poor,* it is impractical to create, improve, or maintain habitat because of the very severe limitations. Unsatisfactory results are probable.

Not considered in the ratings are present land use, the location of a soil in relation to other soils, and the mobility of wildlife.

Engineering[5]

This section is useful to those who need information about soils used as structural material or as foundation upon which structures are built. Among those who can benefit from this section are planning commissions, town and city managers, land developers, engineers, contractors, and farmers.

Among properties of soils highly important in engineering are permeability, strength, compaction characteristics, drainage condition, shrink-swell potential, grain size, plasticity, and reaction. Also important are depth to the water table, depth to bedrock, and slope. These properties, in various degrees and combinations, affect construction and maintenance of roads, airports, pipelines, foundations for small buildings, irrigation systems, ponds and small dams, and systems for disposal of sewage and refuse.

Information in this part of the soil survey can be helpful to those who—

1. Select potential residential, industrial, commercial, and recreational sites.
2. Evaluate alternate routes for roads, highways, pipelines, and underground cables.
3. Seek sources of gravel, sand, or clay.
4. Plan farm drainage systems, ponds, terraces, and other structures for controlling water and conserving soil.
5. Select sites that are suitable for use as filter fields for septic tanks.
6. Correlate performance with soil mapping units to develop information that is useful in designing and maintaining engineering structures.
7. Determine the suitability of soils for cross-country movement of vehicles and construction equipment.
8. Develop other preliminary estimates pertinent to construction in a particular area.

Most of the information in this section is presented in tables 8 and 9, which show, respectively, several estimated soil properties significant in engineering uses.

This information, along with the soil map and other parts of this publication, can be used to make interpretations in addition to those given in table 9, and it also can be used to make other useful maps.

This information, however, does not eliminate need for further investigations at sites selected for engineering works, especially works that involve heavy loads or that require excavations to depths greater than those shown in the tables, generally depths greater than 6 feet. Also, inspection of sites, especially the small ones, is needed because many delineated areas of a given soil mapping unit may contain small areas of other kinds of soil that have strongly contrasting properties and different suitabilities or limitations for soil engineering.

Some terms used in this soil survey have special meaning in soil science that may not be familiar to engineers. The Glossary defines many of these terms.

Engineering classification systems

The two systems most commonly used in classifying samples of soils for engineering are the Unified system (*2*), used by SCS engineers, the Department of Defense, and others; and the AASHTO system, adopted by the American Association of State Highway and Transportation Officials (*1*).

In the Unified system soils are classified according to particle-size distribution, plasticity, liquid limit, and organic-matter content. Soils are grouped in 15 classes. There are eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes are designated by symbols for both classes; for example, CL-ML.

The AASHTO system is used to classify soils according to those properties that affect use in highway construction and maintenance. In this system, a soil is classified in one of seven basic groups ranging from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. In group A-1 are gravelly soils, which have high bearing strength and are the best soils for subgrade or foundation. At the other extreme, in group A-7, are clay soils, which have low strength when wet and are the poorest soils for subgrade. The estimated AASHTO classification for all soils mapped in the survey area is shown in table 8.

Soil properties significant in engineering

Estimates of soil properties significant in engineering are listed in table 8. These estimates are made for typical soil profiles, by layers sufficiently different to have different significance in soil engineering. The estimates are based on field observations made in the course of mapping, on test data for these and similar

---

[5] JOE D. CARMACK, civil engineer, Soil Conservation Service, helped prepare this section.

TABLE 8.—*Estimated*

[An asterisk in the first column indicates that at least one mapping unit in the series is made up of two or more kinds of soil that
series that appear in the first column. The symbol

Soil series and map symbols	Depth to seasonal water table	Depth to rock	Depth from surface	USDA texture	Classification		Coarse fraction less than 3 inches
					Unified	AASHTO	
	Feet	*Feet*	*Inches*				*Percent*
Alcoa: AaB, AaC, AcC3, AaD, AcD3.	>6	>5	0–7	Loam	CL–ML, CL	A-4	0–2
			7–20	Clay loam	CL	A-6	0–2
			20–74	Clay, sandy clay	MH, CL, ML	A-6, A-7	0–3
Allegheny: Ag	>6	>4	0–16	Loam	ML, CL–ML	A-4	
			16–38	Clay loam	CL	A-4, A-6	
			38–58	Loam, fine sandy loam	CL, CL–ML, SC, SM–SC	A-4	
Allen: AnC, AnD	>6	>6	0–15	Loam	ML, SM, SM–SC, CL–ML	A-4	0–2
			15–42	Loam, clay loam	ML, CL, CL–ML	A-4	0–5
			42–80	Clay loam	CL	A-6, A-7	0–5
Altavista: As	2½–3	>5	0–14	Silt loam	ML, CL, CL–ML	A-4, A-6	
			14–34	Silty clay loam	CL	A-4	
			34–52	Gravelly loam	GM–GC, SM–SC, GC, SC	A-4, A-2, A-6	
Atkins: At	0–1	>6	0–44	Silt loam, loam	CL, ML, CL–ML	A-4	
			44–60	Gravelly fine sandy loam	ML, CL, SM, SC, CL–ML, SM–SC	A-2, A-4	
Beason: Ba	1–2	>6	0–6	Silt loam	CL–ML, CL	A-4	
			6–40	Silty clay loam, clay	CL	A-6, A-7	
			40–60	Silty clay loam	CL	A-6	
Bland: BdD, BdE, BnE. No estimates for Rock outcrop part of BnE.	>6	2–3	0–5	Silt loam	CL, CH	A-7	
			5–25	Clay	CH	A-7	
Brookshire: BrE	>6	>3½	0–36	Loam, silt loam	ML, CL, CL–ML	A-4	0–2
			36–52	Gravelly loam	CL–ML, SC, ML, CL, SM, GM, GC, GM–GC, SM–SC	A-4, A-2	0–5
			52	Sandstone.			
Calvin: CaD, CaE	>6	2–3	0–3	Silt loam	ML, CL, CL–ML	A-4	0
			3–14	Shaly silt loam	CL–ML, CL, GC, GM–GC	A-4, A-6, A-2	0
			14–22	Shaly silt loam	GC, GM–GC	A-6, A-2, A-4	15–35
			22	Shale.			
Cataska: CcF. No estimates for Rock outcrop part.	>6	2–3	0–6	Slaty silt loam	CL–ML, ML, GM–GC, GM	A-4	5–15
			6–16	Slaty silt loam	GM, GM–GC	A-2	10–25
			16	Phyllite rock.			
Chagrin: Cg	3–4	>6	0–50	Silt loam	CL–ML, ML, CL	A-4	
Christian: ChC, ChD, CnD3.	>6	4–7	0–8	Loam	CL–ML, ML, CL	A-4	
			8–44	Clay loam, clay	CL	A-6, A-7	
			44–55	Shaly clay loam	CL, SC	A-6, A-7	0–10
			55	Sandy shale.			
Citico: CtE	>6	3–5	0–48	Channery silt loam	GM–GC, GM, GC, ML, CL, CL–ML	A-4	0–10
			48	Phyllite rock.			
Dandridge: DaD, DaE, DaF.	>6	1–2	0–6	Shaly silty clay loam	SC, CL, GC	A-4, A-6	5–15
			6–14	Shaly silty clay	GC	A-6, A-7, A-2	15–20
			14	Shale.			

engineering properties of the soil

may have different properties and limitations. It is therefore necessary to follow carefully the instructions for referring to other > means more than; the symbol < means less than]

Percentage less than 3 inches passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)						
				Percent		*Inches per hour*	*Inches per inch of soil*	*pH*	
95–100	95–100	90–100	60–75	22–30	6–10	0.6–2.0	0.15–0.18	4.5–5.5	Low.
95–100	95–100	90–100	65–75	28–38	11–18	0.6–2.0	0.14–0.18	4.5–5.5	Low.
95–100	95–100	90–100	55–75	38–53	14–23	0.6–2.0	0.12–0.18	4.5–5.5	Moderate.
80–100	75–100	70–90	55–85	15–25	3–7	0.6–2.0	0.15–0.18	5.1–5.5	Low.
80–100	75–100	70–90	65–85	28–36	9–15	0.6–2.0	0.14–0.18	5.1–5.5	Low.
80–100	75–100	60–85	36–55	20–28	6–9	0.6–2.0	0.10–0.14	5.1–5.5	Low.
90–100	80–100	65–85	40–80	18–26	3–7	0.6–2.0	0.14–0.19	4.5–5.5	Low.
85–100	80–100	75–95	60–75	25–38	6–18	0.6–2.0	0.15–0.18	4.5–5.5	Low.
85–100	80–100	70–95	65–85	25–45	11–22	0.6–2.0	0.12–0.18	4.5–5.5	Low.
80–100	75–100	70–90	60–80	20–30	3–9	0.6–2.0	0.16–0.20	5.1–5.5	Low.
80–100	75–100	70–95	65–85	20–30	9–15	0.6–2.0	0.15–0.20	5.1–5.5	Low.
55–75	50–75	45–60	30–40	20–30	7–13	0.6–2.0	0.10–0.15	5.1–5.5	Low.
95–100	90–100	85–95	65–95	<30	[1]NP–10	0.6–2.0	0.17–0.20	5.1–5.5	Low.
70–100	65–90	50–65	30–60	<30	NP–9	0.6–6.0	0.08–0.20	5.1–5.5	Low.
100	95–100	90–100	75–90	20–30	5–10	0.6–2.0	0.18–0.22	5.1–6.0	Low.
100	95–100	90–95	85–95	36–48	15–20	0.2–0.6	0.16–0.18	5.1–5.5	Low.
100	95-100	90–95	80–95	30–40	11–17	0.2–0.6	0.15–0.20	5.1–5.5	Low.
90–95	85–95	75–95	60–95	40–55	25–35	0.6–2.0	0.16–0.20	5.1–5.5	Moderate.
90–100	85–95	75–95	65–90	60–75	35–45	0.2–0.6	0.10–0.15	5.1–7.3	Moderate.
75–85	70–85	65–75	50–65	17–30	3–10	0.6–6.0	0.10–0.14	5.1–5.5	Low.
55–80	50–75	45–65	30–60	17–30	3–10	0.6–6.0	0.08–0.12	5.1–5.5	Low.
80–100	75–90	70–90	60–85	15–24	3–8	2.0–6.0	0.12–0.16	4.5–5.5	Low.
35–60	30–60	25–60	20–55	15–28	4–12	2.0–6.0	0.08–0.12	4.5–5.5	Low.
25–50	20–40	15–40	15–37	15–28	4–12	2.0–6.0	0.04–0.08	4.5–5.5	Low.
55–80	50–75	45–70	40–65	16–25	2–6	0.6–2.0	0.10–0.14	4.5–5.5	Low.
15–50	10–45	10–40	10–35	16–25	2–7	0.6–2.0	0.04–0.09	4.5–5.5	Low.
100	90–100	85–95	70–85	20–30	3–10	0.6–2.0	0.16–0.20	5.6–7.3	Low.
100	95–100	85–95	60–75	16–28	3–9	0.6–2.0	0.17–0.19	5.1–5.5	Low.
95–100	95–100	90–100	70–80	35–48	15–25	0.6–2.0	0.15–0.17	4.5–5.5	Low.
70–85	60–75	50–65	40–55	30–48	12–25	0.6–2.0	0.11–0.15	4.5–5.5	Low.
60–90	50–80	45–80	35–80	15–25	3–9	0.6–2.0	0.12–0.15	5.1–5.5	Low.
30–80	45–90	35–75	35–70	25–40	8–20	0.6–2.0	0.08–0.14	6.1–7.8	Low.
25–50	25–55	15–45	15–40	35–60	15–35	0.2–0.6	0.06–0.10	6.1–7.8	Low.

TABLE 8.—*Estimated*

Soil series and map symbols	Depth to seasonal water table	Depth to rock	Depth from surface	USDA texture	Classification		Coarse fraction less than 3 inches
					Unified	AASHTO	
	Feet	*Feet*	*Inches*				*Percent*
Decatur: DcB, DcC, DcD2, DdC3, DdD3.	>6	>6	0–6	Silt loam	CL–ML, ML, CL	A–4, A–6	0
			6–14	Silty clay loam	ML, CL	A–4, A–6, A–7	0
			14–72	Clay	CL, ML, MH	A–6, A–7	0–3
Dewey: DeB, DeC, DeD2, DgC3, DgD3.	>6	>6	0–6	Silt loam	ML, CL–ML	A–4	0
			6–10	Silty clay loam	CL	A–4, A–6	0
			10–72	Clay	CL, MH, ML, CH	A–6, A–7	0
Ditney: DhD, DhF	>6	2–3	0–30	Loam or cobbly loam	ML, CL, CL–ML, SM–SC, SM, GM, GC, GM–GC	A–4	2–15
			30	Sandstone.			
Dunmore: DmB, DmC, DmD2, DmE2, DnC3, DnD3.	>6	>6	0–7	Silt loam	CL–ML, CL	A–4	0–2
			7–11	Silty clay loam	CL	A–6	0–2
			11–65	Clay	MH, CH	A–7	0–2
Dunning: Du	0–1	>4	0–9	Silty clay loam	CL–ML, CL	A–4, A–6	0
			9–23	Silty clay loam	CL	A–7, A–6	0
			23–55	Clay	CH, MH, CL	A–7	0
Emory: Em	>6	>6	0–55	Silt loam	CL, ML	A–4, A–6	0
Etowah: EtB, EtC, EtD	>6	>6	0–7	Silt loam	CL–ML, CL	A–4	0
			7–60	Silty clay loam	CL	A–4, A–6	0
Farragut: FaC2, FgD3	>6	3–6	0–5	Silt loam	CL–ML, CL	A–4, A–6	0
			5–45	Clay, silty clay	CH, CL	A–6, A–7	0
			45	Shale.			
Fletcher: FhC, FhD	>6	3–6	0–18	Silt loam	ML, CL, CL–ML	A–4, A–6	0
			18–32	Silty clay loam	CL–ML, CL, ML	A–4, A–6	0
			32	Phyllite rock.			
Fullerton: FtC, FtD, FtE	>6	>6	0–13	Cherty silt loam	SM–SC, GM–GC, GC, ML, GM, CL, CL–ML, SM, SC	A–4	0–5
			13–23	Cherty silty clay loam	CL, GC	A–6, A–7	0–5
			23–60	Cherty clay	CL, MH, GC	A–7	0–5
Gladeville: GdD No estimates for Rock outcrop part.	>6	<1	0–8	Flaggy silty clay loam, flaggy clay.	GC, CL, CH	A–2, A–6, A–7	5–20
			8	Limestone.			
Greendale: Gr	>6	>6	0–55	Silt loam	CL–ML, ML, CL	A–4, A–6	
Hamblen: Ha	2–3	3½–12	0–55	Silt loam	CL, ML, CL–ML	A–4, A–6	
Hartsells: HeC	>6	2–3	0–8	Fine sandy loam	SM–SC, SM, ML, CL–ML	A–2, A–4	0–2
			8–16	Loam	ML, CL–ML	A–4	0–2
			16–33	Clay loam	CL	A–6, A–4	0–5
			33	Sandstone.			
Holston: HoC	>6	>5	0–16	Loam	ML, CL–ML	A–4	0–5
			16–60	Silty clay loam, clay loam	CL	A–4, A–6	0–10
Jefferson: JeC, JeD, JeE, JfD, JfE.	>6	>6	0–7	Fine sandy loam	GM, GM–GC, SM, SM–SC, ML, CL–ML	A–2, A–4	2–10
			7–43	Loam	CL–ML, GM, SM, CL, ML, GM–GC, SM–SC	A–4, A–6	2–10
			43–60	Gravelly sandy loam	GM–GC, GC, SM–SC, SC	A–4 ,A–6 A–2	2–15

engineering properties of the soil—Continued

Percentage less than 3 inches passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)						
						Inches per hour	*Inches per inch of soil*	*pH*	
90–100	90–100	85–95	65–75	20–32	5–12	0.6–2.0	0.15–0.20	4.5–6.0	Low.
90–100	90–100	85–95	75–90	32–49	8–22	0.6–2.0	0.14–0.17	4.5–5.5	Low.
90–100	90–100	85–95	75–90	40–55	15–25	0.6–2.0	0.12–0.16	4.5–5.5	Moderate.
90–100	90–100	75–95	65–80	24–30	4–9	0.6–2.0	0.18–0.20	5.1–5.5	Low.
90–100	80–100	75–95	65–80	30–40	10–18	0.6–2.0	0.14–0.17	5.1–5.5	Low.
90–100	80–100	75–95	70–90	34–55	12–28	0.6–2.0	0.11–0.15	5.1–5.5	Moderate.
65–95	55–85	50–70	36–70	20–30	3–7	2.0–6.0	0.10–0.15	4.5–5.5	Low.
85–100	80–90	70–80	65–75	20–30	5–10	0.6–2.0	0.17–0.20	4.5–5.5	Low.
90–100	80–95	75–95	70–90	30–40	12–20	0.6–2.0	0.17–0.18	4.5–5.5	Low.
90–100	80–95	75–95	75–95	50–70	20–35	0.6–2.0	0.10–0.16	4.5–5.5	Moderate.
95–100	95–100	85–95	75–85	20–35	7–15	0.6–2.0	0.16–0.20	6.1–7.3	Low.
95–100	95–100	90–100	85–100	30–45	11–20	0.6–2.0	0.14–0.18	6.1–7.3	Moderate.
95–100	95–100	90–100	85–100	45–75	20–45	0.06–0.2	0.10–0.15	6.1–7.3	High.
95–100	90–100	85–100	80–95	23–39	7–16	0.6–2.0	0.18–0.20	5.1–6.0	Low.
95–100	95–100	85–95	70–85	20–26	5–9	0.6–2.0	0.17–0.20	5.1–5.5	Low.
95–100	95–100	85–95	80–90	25–35	10–15	0.6–2.0	0.16–0.20	5.1–5.5	Low.
95–100	95–100	90–100	80–95	20–30	5–15	0.6–2.0	0.15–0.20	4.5–5.5	Low.
90–100	85–100	80–95	70–90	40–60	20–35	0.6–2.0	0.12–0.15	4.5–5.5	Moderate.
95–100	95–100	90–100	85–95	15–30	3–12	0.6–2.0	0.18–0.20	4.5–5.5	Low.
95–100	95–100	90–100	85–95	27–36	4–12	0.6–2.0	0.18–0.20	4.5–5.5	Low.
55–85	50–85	40–70	35–65	16–30	3–10	0.6–2.0	0.12–0.16	4.5–5.5	Low.
70–85	50–85	40–70	35–65	30–42	11–17	0.6–2.0	0.10–0.15	4.5–5.5	Low.
70–85	50–85	45–70	40–70	48–70	21–35	0.6–2.0	0.10–0.14	4.5–5.5	Low.
40–60	30–55	25–55	20–55	38–55	20–34	0.6–2.0	0.05–0.11	6.6–8.4	Moderate.
80–100	75–100	70–95	65–95	20–35	4–12	0.6–2.0	0.15–0.20	5.1–5.5	Low.
100	95–100	85–95	80–85	22–38	5–14	0.6–2.0	0.18–0.20	5.6–7.3	Low.
90–100	80–100	60–75	35–55	<20	3–7	2.0–6.0	0.12–0.18	4.5–5.5	Low.
95–100	95–100	75–90	50–75	<20	3–7	2.0–6.0	0.12–0.18	4.5–5.5	Low.
95–100	90–100	70–95	55–70	25–36	10–15	0.6–2.0	0.13–0.17	4.5–5.5	Low.
90–100	85–95	75–90	60–80	<25	NP–7	0.6–2.0	0.17–0.20	4.5–5.5	Low.
90–100	85–95	85–95	80–90	20–30	8–15	0.6–2.0	0.16–0.20	4.5–5.5	Low.
65–80	60–80	50–65	30–55	<22	NP–7	2.0–6.0	0.13–0.17	4.0–5.5	Low.
65–80	60–80	55–75	35–60	24–33	7–12	2.0–6.0	0.10–0.17	4.0–5.5	Low.
40–80	35–75	30–60	25–50	24–33	7–12	2.0–6.0	0.10–0.15	4.0–5.5	Low.

TABLE 8.—*Estimated*

Soil series and map symbols	Depth to seasonal water table	Depth to rock	Depth from surface	USDA texture	Classification		Coarse fraction less than 3 inches
					Unified	AASHTO	
	Feet	*Feet*	*Inches*				*Percent*
Jeffrey: JyD, JyF	>6	2–3½	0–25	Cobbly loam	SM–SC, SM, ML, CL–ML	A–4	2–20
			25–32	Cobbly sandy loam	GM–GC, SM–SC, SM, GM, CL–ML, ML	A–4, A–2	5–20
			32	Sandstone.			
Leadvale: LeB	2–3	3–6	0–16	Silt loam	CL–ML, ML, CL	A–4	
			16–23	Silty clay loam	CL, CL–ML	A–6, A–4	
			23–35	Silty clay loam	CL	A–6	
			35–55	Silty clay	CL, MH, ML	A–7, A–6	
Linker: LkC	>6	2–3½	0–6	Loam	ML, CL–ML	A–4	
			6–14	Loam	CL–ML, CL	A–4, A–6	
			14–28	Clay loam	CL	A–6	
			28–34	Gravelly clay loam	CL, SC, GC	A–6	
			34	Sandstone.			
*Litz: LtC, LtD, LtD3, LtE, LY. For Sequoia part of LY, see Sequoia series. Gullied land part of LY is too variable to rate.	>6	2–3½	0–8	Shaly silt loam	CL–ML, CL	A–4	0–10
			8–22	Shaly silt loam or shaly silty clay loam.	CL, GC	A–6, A–4	15–30
			22	Shale.			
Lobdell: Lz	2–3	>5	0–41	Silt loam, loam	CL–ML, ML, CL	A–4	0–2
			41–55	Gravelly fine sandy loam	ML, CL, CL–ML	A–4	0–2
Minvale: MnB, MnC	>6	>6	0–11	Silt loam	CL–ML, ML, CL	A–4	
			11–43	Silty clay loam	CL	A–6	
			43–60	Clay	CL, MH	A–6, A–7	
Montevallo: MtE	>6	2–3	0–6	Shaly silt loam	ML, CL–ML	A–4	
			7–16	Shaly silt loam	GC	A–2, A–4, A–6	
			17	Shale.			
Neubert: Ne	>6	>6	0–63	Loam, fine sandy loam	CL–ML, SM–SC, ML, SM, CL, SC	A–4	
Newark: Nk	0–1½	>6	0–60	Silt loam	CL–ML, ML	A–4	
Philo: Ph	2–3	>4	0–38	Silt loam, loam	ML, CL, CL–ML,	A–4	0–3
			38–52	Gravelly fine sandy loam	ML, CL, GM, GM–GC GC, SM, SC, SM–SC	A–2, A–4	0–10
Pope: Po	>4	>4	0–36	Loam	CL–ML, ML	A–4	
			36–56	Fine sandy loam	SM–SC, CL–ML, SM, ML	A–4, A–2	0–10
Purdy: Pu	0–1	>4	0–12	Silt loam	CL–ML, CL	A–4, A–6	
			12–28	Silty clay loam	CL	A–6, A–7	
			28–50	Clay	CL	A–6, A–7	
Ramsey: RaF. No estimate for Rock outcrop part.	>6	½–2	0–16	Sandy loam	CL–ML, ML, CL, SM, SC, SM–SC	A–2, A–4	5–10
			16	Sandstone.			
Ranger: RgD, RgF	>6	2–3	0–6	Channery silt loam	CL–ML, ML, GM–GC	A–4	0–5
			6–26	Channery silt loam	GM, GC	A–4, A–2	25–40
			26	Phyllite rock.			
Sequatchie: Sa	>6	>5	0–34	Loam	SM–SC, CL–ML, SM, SC, ML, CL	A–4	
			34–55	Loam	ML, CL, CL–ML, SM, SC, SM–SC, GM–GC, GM, GC	A–4, A–2	0–5

engineering properties of the soil—Continued

Percentage less than 3 inches passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)						
				Percent		*Inches per hour*	*Inches per inch of soil*	*pH*	
80–90	70–85	65–80	40–60	20–30	3–7	0.6–6.0	0.14–0.18	4.5–5.5	Low.
65–90	55–85	45–75	30–60	25–30	3–7	0.6–6.0	0.10–0.15	4.5–5.5	Low.
95–100	95–100	85–95	75–95	20–30	3–9	0.6–2.0	0.18–0.22	4.5–5.5	Low.
95–100	95–100	90–100	80–95	25–35	7–14	0.6–2.0	0.18–0.20	4.5–5.5	Low.
90–100	80–100	75–100	70–95	28–38	11–16	0.06–0.6	0.06–0.11	4.5–5.5	Low.
90–100	70–100	65–95	60–90	35–50	15–25	0.06–0.6	0.03–0.07	4.5–5.5	Low.
95–100	90–100	70–90	55–60	15–20	3–7	0.6–2.0	0.12–0.16	4.5–5.5	Low.
95–100	90–100	75–90	55–65	20–30	5–15	0.6–2.0	0.16–0.19	4.5–5.1	Low.
95–100	90–100	80–95	50–60	25–35	11–20	0.6–2.0	0.16–0.19	4.5–5.1	Low.
60–80	50–75	45–70	40–65	25–35	11–20	0.6–2.0	0.13–0.16	4.5–5.1	Low.
70–90	65–85	60–75	55–65	20–30	4–10	0.6–2.0	0.14–0.17	4.5–5.5	Low.
60–70	50–60	45–55	36–50	28–38	10–18	0.6–2.0	0.07–0.12	4.5–5.5	Low.
80–100	75–95	85–95	65–90	20–30	3–9	0.6–2.0	0.18–0.22	5.6–6.5	Low.
65–75	60–75	55–75	50–65	15–25	3–10	0.6–2.0	0.16–0.20	5.6–6.1	Low.
80–100	80–95	70–85	65–75	18–25	3–9	0.6–2.0	0.18–0.20	5.1–6.0	Low.
80–100	80–95	70–90	65–80	30–39	11–17	0.6–2.0	0.15–0.18	4.5–5.5	Low.
80–100	80–95	75–95	70–85	35–60	14–25	0.6–2.0	0.12–0.16	4.5–5.5	Low.
60–90	60–90	60–75	55–65	25–35	5–10	0.6–2.0	0.06–0.12	5.1–5.5	Low.
30–65	30–55	30–50	25–40	20–35	9–15	0.6–2.0	0.06–0.12	5.1–5.5	Low.
90–100	85–100	60–85	45–75	20–30	2–10	0.6–2.0	0.16–0.18	5.5–6.5	Low.
95–100	95–100	90–100	80–95	25–39	5–10	0.6–2.0	0.18–0.20	6.1–7.8	Low.
95–100	80–100	65–85	55–75	20–40	3–9	0.6–2.0	0.17–0.20	5.1–5.5	Low.
50–75	40–75	35–60	30–55	20–40	3–9	2.0–6.0	0.06–0.10	5.1–5.5	Low.
95–100	90–100	80–95	55–75	15–25	3–7	2.0–6.0	0.14–0.18	5.1–6.0	Low.
55–90	50–90	40–75	20–55	15–25	3–7	2.0–6.0	0.12–0.16	5.1–5.5	Low.
95–100	90–95	90–95	80–90	20–30	5–15	0.2–0.6	0.18–0.20	4.5–5.5	Low.
95–100	95–100	90–100	85–95	35–45	12–20	0.06–0.2	0.16–0.18	4.5–5.5	Low.
95–100	95–100	90–100	85–95	35–48	15–25	<0.06	0.12–0.16	4.5–5.5	Moderate.
80–100	75–100	60–95	30–70	15–25	2–8	6.0–20.0	0.06–0.10	4.5–5.5	Low.
70–90	65–85	60–80	50–70	<30	2–7	0.6–2.0	0.12–0.15	4.5–5.5	Low.
45–65	40–65	30–60	25–50	<30	2–10	0.6–2.0	0.07–0.12	4.5–5.5	Low.
95–100	90–100	80–95	40–75	<25	NP–10	0.6–2.0	0.16–0.18	4.5–5.5	Low.
65–95	55–80	35–65	25–55	<25	NP–10	0.6–2.0	0.15–0.18	4.5–5.5	Low.

TABLE 8.—*Estimated*

Soil series and map symbols	Depth to seasonal water table	Depth to rock	Depth from surface	USDA texture	Classification		Coarse fraction less than 3 inches
					Unified	AASHTO	
	Feet	*Feet*	*Inches*				*Percent*
Sequoia: SeB, SeC2, SeD2, SgC3, SgD3.	>6	2–3½	0–6	Silt loam	CL, CL–ML	A–4, A–6	
			6–34	Silty clay	MH, CL, CH	A–7	
			34	Shale.			
Shelocta: ShC, ShD	>6	>4	0–18	Silt loam	CL–ML, ML, CL	A–4	
			18–48	Silty clay loam	CL–ML, CL	A–4, A–6	
			48–60	Silt loam	ML, CL, CL–ML, SM–SC, SM, GC, GM–GC	A–4, A–2	0–8
Shouns: SnD	>6	>5	0–14	Silt loam	CL–ML, CL, ML	A–4	0–5
			14–39	Silty clay loam	CL	A–6, A–4	0–5
			39–56	Loam	CL, GC, SC	A–4, A–6, A–2	0–10
Spivey: SpF	>6	>3½	0–60	Cobbly loam	GC, GM, GM–GC, SC, SM, SM–SC	A–4, A–2	15–30
Staser: Ss	>6	>6	0–35	Loam	CL–ML, ML, CL	A–6, A–4	0
			35–52	Fine sandy loam	CL–ML, CL, SM, SM–SC, ML	A–4, A–6	0–5
Statler: St	>6	>6	0–60	Loam	ML, CL, CL–ML	A–6, A–4	
Steekee: SvF	>6	1–2	0–18	Loam	CL–ML, ML, CL, SM–SC, SM, SC	A–4	0–10
			18	Sandstone or sandy shale.			
Sylco: SyF	>6	2–3½	0–24	Channery silt loam	CL–ML, ML, GM, GM–GC	A–4	0–15
			24–33	Channery silt loam	GM, GM–GC, SM, SM–SC	A–4, A–2	20–40
			33	Phyllite rock.			
Talbott: TaC2, TaD2, TbC3, TbD3, TcD, TcE. No estimates for Rock outcrop part of TcD and TcE.	>6	2–3½	0–5	Silt loam	ML, CL, CL–ML	A–4, A–6	
			5–34	Clay	CL, CH, MH	A–6, A–7	
			34	Limestone.			
*Tellico: TeD, TeE, TeF, ToD3, ToE3, TS. For Dewey part of TS, see Dewey series. Gullied land part of TS is too variable to rate.	>6	3½–5	0–8	Loam	CL–ML, CL	A–4	
			8–44	Clay loam	CL, MH	A–6, A–7	
			44	Sandstone.			
Transylvania: Ty	>5	>6	0–70	Loam or silt loam	CL–ML, ML, CL	A–4	
Unicoi: UcF	>6	1–2	0–16	Cobbly loam	SM–SC, SM, GM, GM–GC	A–2	30–50
			16	Sandstone.			
Wallen: WaF	>6	2–3½	0–6	Gravelly fine sandy loam	SM, ML, SM–SC, CL–ML	A–4, A–2	2–10
			6–32	Gravelly loam or gravelly sandy loam.	GM, GM–GC, GC	A–2, A–4, A–1	15–30
			32	Sandstone.			
Waynesboro: WbB, WbC, WbD, WbE, WnC3, WnD3.	>6	>6	0–16	Loam	ML, CL–ML	A–4	0–2
			16–24	Clay loam	CL, ML	A–4, A–6	0–3
			24–60	Clay	CL, ML, MH	A–7, A–6	0–3
Whitwell: Wt	2–3	>6	0–10	Loam	CL–ML	A–4	1–3
			10–20	Clay loam	CL	A–6, A–4	1–3
			20–41	Loam	ML, CL, CL–ML	A–4	1–3
			41–60	Loam	ML, SM, CL–ML, SM–SC	A–4	0–10

---

[1]NP = nonplastic.

engineering properties of the soil—Continued

Percentage less than 3 inches passing sieve—				Liquid limit	Plasticity index	Permeability	Available water capacity	Reaction	Shrink-swell potential
No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)						
				Percent		*Inches per hour*	*Inches per inch of soil*	*pH*	
95–100	95–100	90–100	85–95	23–33	5–16	0.6–2.0	0.17–0.20	4.5–5.5	Low.
85–100	80–100	75–100	70–95	43–74	20–35	0.2–0.6	0.15–0.18	4.5–5.5	Moderate.
75–90	65–80	60–75	55–70	20–30	3–9	0.6–2.0	0.17–0.20	4.5–5.5	Low.
70–90	60–80	55–70	50–65	24–30	6–12	0.6–2.0	0.15–0.18	4.5–5.5	Low.
50–90	40–80	30–75	25–70	20–30	6–10	0.6–2.0	0.13–0.16	4.5–5.0	Low.
70–90	60–90	55–85	50–80	18–25	3–9	0.6–2.0	0.15–0.17	5.1–5.5	Low.
70–90	60–90	60–85	55–75	25–38	10–15	0.6–2.0	0.10–0.16	5.1–5.5	Low.
50–90	45–85	35–80	30–70	20–35	8–15	0.6–2.0	0.10–0.15	5.1–5.5	Low.
50–70	45–60	35–50	25–40	15–30	2–10	0.6–6.0	0.06–0.11	4.5–5.5	Low.
95–100	90–100	70–95	55–85	20–35	4–18	0.6–2.0	0.18–0.22	5.6–7.3	Low.
95–100	85–100	65–95	45–85	20–38	4–18	0.6–6.0	0.12–0.18	5.6–7.3	Low.
95–100	90–100	80–100	55–75	15–25	4–12	0.6–2.0	0.17–0.22	5.1–6.0	Low.
80–100	80–100	60–80	40–60	15–30	3–9	0.6–2.0	0.10–0.15	4.5–5.5	Low.
70–90	65–85	55–75	45–70	22–32	3–8	0.6–2.0	0.12–0.16	4.5–5.5	Low.
35–65	30–60	25–50	20–45	22–32	3–8	0.6–2.0	0.05–0.10	4.5–5.5	Low.
95–100	95–100	90–100	70–100	25–45	5–15	0.6–2.0	0.12–0.18	5.1–5.5	Moderate.
95–100	95–100	90–100	80–100	45–80	12–45	0.2–0.6	0.10–0.14	5.1–5.6	Moderate.
95–100	90–100	80–100	55–65	23–30	7–10	0.6–2.0	0.15–0.17	4.5–5.5	Low.
95–100	80–100	75–100	70–75	36–55	15–20	0.6–2.0	0.15–0.17	4.5–5.5	Low.
100	95–100	85–95	55–75	15–25	3–9	0.6–2.0	0.18–0.22	5.1–6.0	Low.
60–75	40–65	30–50	20–35	15–25	3–6	2.0–6.0	0.07–0.11	4.5–5.5	Low.
70–85	65–80	45–70	30–55	20–30	3–7	2.0–6.0	0.07–0.12	4.5–5.5	Low.
35–65	30–60	20–55	15–40	20–30	3–9	2.0–6.0	0.07–0.12	4.5–5.5	Low.
95–100	90–95	70–95	55–70	16–25	3–7	0.6–2.0	0.17–0.20	4.5–5.5	Low.
95–100	80–100	75–95	55–75	30–40	7–16	0.6–2.0	0.16–0.19	4.5–5.5	Low.
95–100	90–100	75–95	60–80	38–68	11–28	0.6–2.0	0.14–0.17	4.5–5.5	Moderate.
90–100	80–95	65–85	60–80	20–30	3–10	0.6–2.0	0.17–0.20	5.1–5.5	Low.
90–100	80–95	70–85	65–80	25–35	7–15	0.6–2.0	0.16–0.20	5.1–5.5	Low.
85–95	80–90	65–85	60–75	15–25	3–9	0.6–2.0	0.15–0.19	5.1–5.5	Low.
75–95	75–95	60–85	45–75	15–25	3–7	0.6–2.0	0.12–0.16	5.1–5.5	Low.

TABLE 9.—*Interpretations*

[An asterisk in the first column indicates that at least one mapping unit in the series is made up of two or more kinds of soil that
series that appear

Soil series and map symbols	Degree and kind of limitation for—					
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sanitary landfills	Local roads and streets
Alcoa:						
AaB	Slight	Moderate: slope; seepage.	Slight	Slight	Moderate: too clayey.	Moderate: low strength.
AaC, AcC3	Slight	Severe: slope	Slight	Slight	Slight	Moderate: low strength.
AaD, AcD3	Moderate: slope.	Severe: slope	Moderate: slope.	Moderate: slope.	Moderate: slope.	Moderate: slope; low strength.
Allegheny: Ag	Moderate: floods.	Severe: floods	Slight	Severe: floods	Moderate: floods.	Severe: floods
Allen:						
AnC	Slight	Severe: slope	Slight	Slight	Slight	Moderate: low strength.
AnD	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.	Severe: slope
Altavista: As	Severe: wetness	Moderate: floods; seepage.	Moderate: wetness.	Severe: floods	Severe: wetness.	Moderate: low strength; floods.
Atkins: At	Severe: floods; wetness.	Severe: floods; seepage.	Severe: wetness; floods.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.
Beason: Ba	Severe: percs slowly; floods.	Severe: floods	Severe: wetness	Severe: wetness; floods.	Severe: wetness; floods.	Severe: floods
Bland: BdD, BdE, BnE. Rock outcrop too variable to rate.	Severe: depth to rock; percs slowly; slope.	Severe: depth to rock; slope.	Severe: depth to rock; slope.	Severe: slope	Severe: depth to rock; slope.	Severe: depth to rock; slope.
Brookshire: BrE	Severe: slope	Severe: slope; seepage.	Severe: slope	Severe: slope	Severe: slope; depth to rock; seepage.	Severe: slope
Calvin:						
CaD	Severe: depth to rock.	Severe: depth to rock; slope.	Severe: depth to rock.	Moderate: slope.	Severe: depth to rock.	Moderate: slope; depth to rock.
CaE	Severe: depth to rock; slope.	Severe: depth to rock; slope.	Severe: depth to rock; slope.	Severe: slope	Severe: depth to rock; slope.	Severe: slope
Cataska: CcF Rock outcrop too variable to rate.	Severe: slope; depth to rock; rock outcrop.	Severe: slope; depth to rock.	Severe: slope; depth to rock.	Severe: slope	Severe: slope; depth to rock.	Severe: slope; depth to rock.
Chagrin: Cg	Severe: floods	Severe: floods	Severe: floods	Severe: floods	Severe: floods	Severe: floods
Christian:						
ChC	Moderate: slope; percs slowly.	Severe: slope	Moderate: too clayey.	Slight	Moderate: depth to rock; too clayey.	Moderate: low strength.
ChD, CnD3	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate: depth to rock; too clayey.	Severe: slope
Citico: CtE	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope; depth to rock.	Severe: slope
Dandridge:						
DaD	Severe: depth to rock; percs slowly.	Severe: depth to rock; slope.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
DaE, DaF	Severe: depth to rock; percs slowly; slope.	Severe: depth to rock; slope.	Severe: depth to rock; slope.	Severe: depth to rock; slope.	Severe: depth to rock; slope.	Severe: depth to rock; slope.

of engineering properties

may have different properties and limitations. It is therefore necessary to follow carefully the instructions for referring to other in the first column]

Suitability as source of—		Soil features affecting—			
Road fill	Topsoil	Pond reservoir areas	Embankments, dikes, and levees	Drainage of cropland and pasture	Terraces and diversions
Fair: low strength.	Fair: too clayey.	Seepage.	Compressible; low strength.	Not needed.	Favorable.
Fair: low strength.	Fair: slope; too clayey.	Seepage.	Compressible; low strength.	Not needed.	Slope.
Fair: low strength.	Fair: slope; too clayey.	Seepage.	Compressible; low strength.	Not needed.	Slope.
Fair: low strength.	Good.	Seepage.	Piping.	Floods.	Not needed.
Fair: low strength.	Good.	Seepage.	Piping.	Not needed.	Slope.
Fair: slope; low strength.	Fair: slope.	Seepage.	Piping.	Not needed.	Slope.
Fair: low strength.	Fair: thin layer.	Seepage.	Piping.	Floods; wetness.	Not needed.
Poor: wetness.	Poor: wetness.	Seepage.	Piping.	Floods; wetness.	Not needed.
Fair: low strength; wetness.	Fair: too clayey.	Seepage.	Compressible; hard to pack.	Percs slowly; floods.	Not needed.
Poor: low strength; depth to rock.	Poor: too clayey; thin layer; slope; area reclaim.	Depth to rock; slope.	Low strength; compressible; depth to rock; thin layer.	Not needed.	Slope; depth to rock; percs slowly.
Poor: slope.	Poor: slope; small stones.	Seepage; slope.	Piping.	Not needed.	Slope.
Poor: thin layer.	Poor: thin layer; small stones.	Seepage; depth to rock.	Seepage; thin layer; piping.	Not needed.	Slope; depth to rock.
Poor: thin layer; slope.	Poor: thin layer; small stones; slope.	Depth to rock; slope; seepage.	Thin layer; piping; seepage.	Not needed.	Slope; depth to rock.
Poor: slope; thin layer.	Poor: slope; large stones.	Slope; depth to rock.	Thin layer; seepage; piping.	Not needed.	Slope; depth to rock.
Fair: low strength.	Good.	Seepage.	Piping.	Not needed.	Not needed.
Fair: low strength.	Poor: thin layer; too clayey.	Seepage.	Low strength; hard to pack.	Not needed.	Slope.
Fair: low strength; slope.	Poor: thin layer; too clayey; slope.	Seepage.	Low strength; hard to pack.	Not needed.	Slope.
Poor: slope.	Poor: slope; small stones.	Slope; seepage.	Piping.	Not needed.	Slope.
Poor: thin layer; area reclaim.	Poor: thin layer; too clayey; small stones.	Depth to rock.	Thin layer.	Not needed.	Slope; depth to rock; percs slowly.
Poor: thin layer; area reclaim.	Poor: thin layer; too clayey; small stones.	Depth to rock; slope.	Thin layer.	Not needed.	Slope; depth to rock; percs slowly.

TABLE 9.—*Interpretations*

Soil series and map symbols	Degree and kind of limitation for—					
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sanitary landfills	Local roads and streets
Decatur:						
DcB	Slight	Moderate: slope; seepage.	Moderate: too clayey.	Slight	Moderate: too clayey.	Moderate: low strength.
DcC, DdC3	Slight	Severe: slope	Moderate: too clayey.	Slight	Moderate: too clayey.	Moderate: low strength.
DcD2, DdD3	Moderate: slope.	Severe: slope	Moderate: too clayey.	Moderate: slope.	Moderate: too clayey; slope.	Moderate: low strength.
Dewey:						
DeB	Slight	Moderate: slope; seepage.	Moderate: too clayey.	Slight	Moderate: too clayey.	Moderate: low strength.
DeC, DgC3	Slight	Severe: slope	Moderate: too clayey.	Slight	Moderate: too clayey.	Moderate: low strength.
DeD2, DgD3	Moderate: slope.	Severe: slope	Moderate: too clayey.	Moderate: slope.	Moderate: too clayey; slope.	Moderate: slope; low strength.
Ditney: DhD, DhF	Severe: slope; depth to rock.	Severe: slope; depth to rock.	Severe: slope; depth to rock.	Severe: slope	Severe: slope; depth to rock.	Severe: slope
Dunmore:						
DmB	Moderate: percs slowly.	Moderate: slope; seepage.	Moderate: too clayey.	Moderate: shrink-swell; low strength.	Severe: too clayey.	Moderate: low strength; shrink-swell.
DmC, DnC3	Moderate: percs slowly.	Severe: slope	Moderate: too clayey.	Moderate: shrink-swell; low strength.	Severe: too clayey.	Moderate: low strength; shrink-swell.
DmD2, DnD3	Moderate: slope; percs slowly.	Severe: slope	Moderate: too clayey.	Moderate: slope; shrink-swell; low strength.	Severe: too clayey.	Moderate: low strength; slope; shrink-swell.
DmE2	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope; too clayey.	Severe: slope
Dunning: Du	Severe: floods; wetness.	Severe: floods	Severe: floods; too clayey.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness; low strength.
Emory: Em	Moderate: floods.	Moderate: seepage.	Slight	Severe: floods	Moderate: seepage; floods.	Moderate: low strength; floods.
Etowah:						
EtB	Slight	Moderate: slope; seepage.	Slight	Slight	Slight	Moderate: low strength.
EtC	Slight	Severe: slope	Slight	Slight	Slight	Moderate: low strength.
EtD	Moderate: slope.	Severe: slope	Moderate: slope.	Moderate: slope.	Moderate: slope.	Moderate: low strength; slope.
Farragut:						
FaC2	Severe: percs slowly.	Severe: slope	Severe: too clayey.	Moderate: low strength; shrink-swell.	Severe: too clayey; depth to rock.	Severe: low strength.
FgD3	Severe: percs slowly; slope.	Severe: slope	Severe: slope; too clayey.	Moderate: slope; shrink-swell; low strength.	Severe: too clayey; depth to rock.	Severe: low strength.
Fletcher:						
FhC	Moderate: depth to rock.	Severe: slope	Moderate: depth to rock.	Slight	Severe: depth to rock.	Moderate: low strength.
FhD	Moderate: depth to rock; slope.	Severe: slope	Moderate: slope; depth to rock.	Moderate: slope.	Severe: depth to rock.	Moderate: slope; low strength.
Fullerton:						
FtC	Slight	Severe: slope	Moderate: too clayey; small stones.	Slight	Moderate: too clayey.	Moderate: slope; low strength.

of engineering properties—Continued

Suitability as source of—		Soil features affecting—			
Road fill	Topsoil	Pond reservoir areas	Embankments, dikes, and levees	Drainage of cropland and pasture	Terraces and diversions
Fair: low strength	Fair: too clayey; thin layer.	Seepage	Compressible; low strength	Not needed	Favorable.
Fair: low strength	Fair: too clayey; thin layer.	Seepage	Compressible; low strength	Not needed	Slope.
Fair: low strength	Poor: too clayey; slope.	Seepage	Compressible; low strength	Not needed	Slope.
Fair: low strength	Fair: too clayey; thin layer.	Seepage	Compressible; low strength	Not needed	Favorable.
Fair: low strength	Fair: too clayey; thin layer; slope.	Seepage	Compressible; low strength	Not needed	Slope.
Fair: low strength	Poor: too clayey; slope; thin layer.	Seepage	Compressible; low strength	Not needed	Slope.
Poor: slope; thin layer.	Poor: slope; area reclaim.	Slope; depth to rock; seepage.	Seepage; thin layer; piping	Not needed	Slope; depth to rock.
Fair: low strength; shrink-swell.	Poor: too clayey; thin layer.	Seepage	Compressible; low strength; hard to pack.	Not needed	Favorable.
Fair: low strength	Poor: too clayey; thin layer.	Seepage	Compressible; low strength; hard to pack.	Not needed	Slope.
Fair: low strength	Poor: too clayey; thin layer.	Seepage	Compressible; low strength; hard to pack.	Not needed	Slope.
Poor: slope	Poor: too clayey; slope; thin layer.	Seepage; slope	Compressible; low strength; hard to pack.	Not needed	Slope.
Poor: low strength; wetness.	Poor: too clayey; wetness.	Favorable	Compressible; hard to pack; low strength.	Floods; percs slowly; wetness.	Not needed.
Fair: low strength	Good	Seepage	Compressible; piping	Not needed	Not needed.
Fair: low strength	Good	Seepage	Compressible	Not needed	Favorable.
Fair: low strength	Good	Seepage	Compressible	Not needed	Favorable.
Fair: low strength	Fair: slope	Seepage	Compressible	Not needed	Slope.
Poor: low strength	Poor: too clayey	Favorable	Compressible; low strength; hard to pack.	Not needed	Slope.
Poor: low strength	Poor: too clayey	Favorable	Compressible; low strength; hard to pack.	Not needed	Slope.
Fair: low strength	Good	Seepage; depth to rock.	Piping; erodes easily	Not needed	Slope.
Fair: low strength	Fair: slope	Seepage; depth to rock.	Piping; erodes easily	Not needed	Slope.
Fair: low strength	Poor: small stones	Seepage	Compressible; low strength; hard to pack.	Not needed	Slope.

TABLE 9.—*Interpretations*

Soil series and map symbols	Degree and kind of limitation for—					
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sanitary landfills	Local roads and streets
Fullerton cont.:						
FtD	Moderate: slope.	Severe: slope.	Moderate: too clayey; slope; small stones.	Moderate: slope.	Moderate: too clayey; slope.	Severe: slope.
FtE	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Gladeville: GdD. Rock outcrop too variable to rate.	Severe: percs slowly; depth to rock.	Severe: depth to rock.	Severe: too clayey; depth to rock.	Severe: depth to rock; low strength.	Severe: depth to rock.	Severe: low strength; depth to rock.
Greendale: Gr	Moderate: floods.	Moderate: seepage.	Slight.	Severe: floods.	Moderate: seepage; floods.	Moderate: floods; low strength.
Hamblen: Ha	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
Hartsells: HeC	Severe: depth to rock.	Severe: slope; depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: depth to rock.
Holston: HoC	Slight.	Severe: slope.	Slight.	Slight.	Slight.	Moderate: olw strength.
Jefferson:						
JeC	Slight.	Severe: slope; seepage.	Slight.	Slight.	Severe: seepage.	Moderate: low strength.
JeD	Severe: slope.	Severe: slope; seepage.	Severe: slope.	Severe: slope.	Severe: seepage.	Severe: slope.
JeE	Severe: slope.	Severe: slope; seepage.	Severe: slope.	Severe: slope.	Severe: slope; seepage.	Severe: slope.
JfD	Severe: slope; small stones.	Severe: slope; seepage.	Severe: slope.	Severe: slope.	Severe: seepage.	Severe: slope.
JfE	Severe: slope; small stones.	Severe: slope; seepage.	Severe: slope.	Severe: slope.	Severe: slope; seepage.	Severe: slope.
Jeffrey: JyD, JyF	Severe: slope; depth to rock.	Severe: slope; depth to rock.	Severe: slope; depth to rock.	Severe: slope.	Severe: slope; depth to rock.	Severe: slope.
Leadvale: LeB	Severe: percs slowly.	Moderate: slope.	Moderate: wetness.	Slight.	Moderate: wetness; too clayey.	Moderate: low strength.
Linker: LkC	Severe: depth to rock.	Severe: depth to rock; slope.	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: depth to rock; low strength.
*Litz:						
LtC	Severe: depth to rock; percs slowly.	Severe: depth to rock; slope.	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: depth to rock; low strength.
LtD, LtD3, LtE, LY. For Sequoia part of LY, see SgD3 under Sequoia series. Gullied land part is not rated.	Severe: depth to rock; percs slowly.	Severe: depth to rock; slope.	Severe: slope; depth to rock.	Severe: slope.	Severe: depth to rock.	Severe: slope.
Lobdell: Lz	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
Minvale:						
MnB	Slight.	Moderate: slope.	Slight.	Slight.	Slight.	Moderate: low strength.
MnC	Slight.	Severe: slope.	Slight.	Slight.	Slight.	Moderate: low strength.
Montevallo: MtE	Severe: depth to rock; slope.	Severe: depth to rock; slope.	Severe: depth to rock; slope.	Severe: depth to rock; slope.	Severe: depth to rock.	Severe: slope.

of engineering properties—Continued

Suitability as source of—		Soil features affecting—			
Road fill	Topsoil	Pond reservoir areas	Embankments, dikes, and levees	Drainage of cropland and pasture	Terraces and diversions
Fair: slope; low strength.	Poor: small stones	Seepage	Compressible; low strength; hard to pack.	Not needed	Slope.
Poor: slope	Poor: small stones; slope.	Seepage; slope	Compressible; low strength; hard to pack.	Not needed	Slope.
Poor: thin layer; low strength.	Poor: too clayey; thin layer.	Depth to rock	Thin layer	Not needed	Depth to rock.
Fair: low strength	Good	Seepage	Piping; compressible	Not needed	Not needed.
Fair: low strength	Good	Seepage	Piping; compressible	Floods	Not needed.
Poor: thin layer	Fair: thin layer; area reclaim.	Depth to rock; seepage.	Compressible; piping; seepage.	Not needed	Slope.
Fair: low strength	Good	Seepage	Compressible; piping	Not need	Slope.
Fair: low strength	Fair: small stones	Seepage	Compressible; piping	Not needed	Slope.
Fair: low strength	Poor: slope	Seepage	Compressible; piping	Not needed	Slope.
Poor: slope	Poor: slope	Seepage; slope	Compressible; piping	Not needed	Slope.
Fair: low strength	Poor: small stones; slope.	Seepage	Piping; compressible	Not needed	Slope.
Poor: slope	Poor: small stones; slope.	Seepage; slope	Piping; compressible	Not needed	Slope.
Poor: slope; thin layer.	Poor: slope; small stones.	Seepage; slope	Piping; compressible	Not needed	Slope.
Fair: low strength	Fair: thin layer; area reclaim.	Favorable; area reclaim.	Piping	Percs slowly	Favorable.
Poor: thin layer	Fair: thin layer; area reclaim.	Seepage	Compressible; thin layer; piping.	Not needed	Depth to rock.
Poor: thin layer; area reclaim.	Poor: thin layer	Depth to rock; slope.	Thin layer	Not needed	Depth to rock; slope.
Poor: thin layer; area reclaim.	Poor: thin layer; slope.	Depth to rock; slope.	Thin layer	Not needed	Depth to rock; slope.
Fair: low strength	Good	Seepage	Compressible; piping; low strength.	Floods	Not needed.
Fair: low strength	Fair: thin layer; small stones.	Seepage	Compressible; piping	Not needed	Favorable.
Fair: low strength	Fair: thin layer; small stones.	Seepage	Piping; compressible	Not needed	Slope.
Poor: thin layer	Poor: slope; small stones; thin layer.	Depth to rock; seepage.	Thin layer	Not needed	Slope; depth to rock.

TABLE 9.—*Interpretations*

Soil series and map symbols	Degree and kind of limitation for—					
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sanitary landfills	Local roads and streets
Neubert: **Ne**	Moderate: floods.	Moderate: floods; slope; seepage.	Moderate: floods.	Severe: floods	Moderate: floods.	Severe: floods
Newark: **Nk**	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods	Severe: floods; wetness.	Severe: floods
Philo: **Ph**	Severe: floods	Severe: floods; seepage.	Severe: floods	Severe: floods	Severe: floods; wetness.	Severe: floods
Pope: **Po**	Severe: floods	Severe: floods; seepage.	Severe: floods	Severe: floods	Severe: floods	Severe: floods
Purdy: **Pu**	Severe: percs slowly; floods; wetness.	Severe: floods	Severe: wetness; floods; too clayey.	Severe: wetness; floods.	Severe: wetness; floods.	Severe: wetness; floods.
Ramsey: **RaF** Rock outcrop too variable to rate.	Severe: depth to rock; slope.	Severe: depth to rock; slope.	Severe: depth to rock; slope.	Severe: depth to rock; slope.	Severe: depth to rock; seepage.	Severe: slope; depth to rock.
Ranger: **RgD, RgF**	Severe: depth to rock; slope.	Severe: depth to rock; slope.	Severe: slope; depth to rock.	Severe: slope	Severe: depth to rock; seepage.	Severe: slope; low strength.
Sequatchie:						
Sa, nonflooded	Slight	Moderate: seepage.	Slight	Slight	Moderate: seepage.	Moderate: low strength.
Sa, flooded	Moderate: floods.	Moderate: seepage.	Slight	Severe: floods	Moderate: floods; seepage.	Moderate: low strength.
Sequoia:						
SeB	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Moderate: low strength.	Severe: depth to rock; too clayey.	Severe: low strength.
SeC2, SgC3	Severe: percs slowly.	Severe: slope	Severe: too clayey.	Moderate: low strength.	Severe: depth to rock; too clayey.	Severe: low strength.
SeD2, SgD3	Severe: percs slowly.	Severe: slope	Severe: too clayey.	Moderate: slope; low strength.	Severe: depth to rock; too clayey.	Severe: low strength.
Shelocta:						
ShC	Slight	Severe: slope	Slight	Slight	Slight	Moderate: low strength.
ShD	Moderate: slope.	Severe: slope	Moderate: slope.	Moderate: slope.	Moderate: slope.	Moderate: slope; low strength.
Shouns: **SnD**	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.	Severe: slope
Spivey: **SpF**	Severe: slope	Severe: slope	Severe: slope; small stones.	Severe: slope	Severe: slope; small stones.	Severe: slope
Staser: **Ss**	Severe: floods	Severe: floods	Severe: floods	Severe: floods	Severe: floods	Severe: floods
Statler: **St**	Severe: floods	Severe: floods	Severe: floods	Severe: floods	Severe: floods	Severe: floods
Steekee: **SvF**	Severe: slope; depth to rock.	Severe: depth to rock; slope.	Severe: depth to rock; slope.	Severe: slope	Severe: depth to rock; slope.	Severe: slope
Sylco: **SyF**	Severe: slope; depth to rock.	Severe: slope; depth to rock.	Severe: slope; depth to rock.	Severe: slope	Severe: slope; depth to rock.	Severe: slope
Talbott: **TaC2, TaD2, TbC3, TbD3, TcD.**	Severe: depth to rock; percs slowly.	Severe: depth to rock; slope.	Severe: depth to rock; too clayey.	Moderate: shrink-swell; low strength; slope.	Severe: depth to rock; too clayey.	Severe: low strength.

of engineering properties—Continued

Suitability as source of—		Soil features affecting—			
Road fill	Topsoil	Pond reservoir areas	Embankments, dikes, and levees	Drainage of cropland and pasture	Terraces and diversions
Fair: low strength	Good	Seepage	Piping; compressible	Not needed	Not needed.
Fair: low strength; wetness.	Good	Seepage	Piping; low strength; compressible.	Floods	Not needed.
Fair: low strength	Good	Seepage	Compressible; piping	Floods	Not needed.
Fair: low strength	Good	Seepage	Piping; compressible	Not needed	Not needed.
Poor: wetness; low strength.	Poor: wetness	Favorable	Compressible; hard to pack; low strength.	Floods; percs slowly	Not needed.
Poor: slope; thin layer.	Poor: slope; small stones.	Seepage; depth to rock.	Thin layer; piping	Not needed	Slope; depth to rock.
Poor: slope; thin layer.	Poor: small stones; slope.	Depth to rock; slope.	Thin layer	Not needed	Slope.
Fair: low strength	Good	Seepage	Piping	Not needed	Not needed.
Fair: low strength	Good	Seepage	Piping	Not needed	Not needed.
Poor: low strength	Poor: thin layer; too clayey.	Favorable	Compressible; low strength	Not needed	Favorable.
Poor: low strength	Poor: too clayey; thin layer.	Favorable	Compressible; low strength	Not needed	Slope.
Poor: low strength	Poor: too clayey; slope; thin layer.	Slope	Compressible; low strength	Not needed	Slope.
Fair: low strength	Fair: small stones	Seepage	Compressible; piping	Not needed	Slope.
Fair: low strength	Fair: slope; small stones.	Seepage	Compressible; seepage	Not needed	Slope.
Fair: low strength	Poor: slope	Seepage	Compressible; piping	Not needed	Slope.
Poor: slope	Poor: slope; small stones.	Seepage; slope	Piping	Not needed	Slope.
Fair: low strength	Good	Seepage	Compressible; piping	Not needed	Not needed.
Fair: low strength	Good	Seepage	Compressible; piping	Not needed	Not needed.
Poor: slope; thin layer.	Poor: slope; small stones.	Depth to rock; slope.	Piping; compressible; thin layer.	Not needed	Slope.
Poor: slope; thin layer.	Poor: slope; small stones.	Seepage; slope; depth to rock.	Thin layer; piping	Not needed	Slope.
Poor: low strength	Poor: thin layer; too clayey; area reclaim.	Depth to rock	Unstable fill; thin layer; hard to pack.	Not needed	Slope; depth to rock.

TABLE 9.—*Interpretations*

Soil series and map symbols	Degree and kind of limitation for—					
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sanitary landfills	Local roads and streets
Talbott:						
TcE	Severe: depth to rock; percs slowly; slope.	Severe: depth to rock; slope.	Severe: depth to rock; slope; too clayey.	Severe: slope	Severe: depth to rock; too clayey; slope.	Severe: low strength; slope.
Rock outcrop part of TcD and TcE too variable to rate.						
*Tellico:						
TeD, ToD3	Moderate: slope; depth to rock.	Severe: slope	Moderate: slope; depth to rock.	Moderate: slope; low strength.	Severe: depth to rock.	Severe: low strength.
TeE, TeF, ToE3, TS	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope; depth to rock.	Severe: low strength.
For Dewey part of TS, see DgD3 under Dewey series. Gullied land part is not rated.						
Transylvania: Ty	Severe: floods	Severe: floods	Severe: floods	Severe: floods	Severe: floods	Severe: floods
Unicoi: UcF	Severe: slope; depth to rock.	Severe: depth to rock; slope.	Severe: depth to rock; slope.	Severe: depth to rock; slope.	Severe: depth to rock; slope.	Severe: depth to rock; slope.
Wallen: WaF	Severe: depth to rock; slope.	Severe: depth to rock; slope; seepage.	Severe: depth to rock; slope.	Severe: slope	Severe: depth to rock; slope; seepage.	Severe: slope
Waynesboro:						
WbB	Slight	Moderate: slope; seepage.	Slight	Moderate: low strength.	Slight	Moderate: low strength.
WbC, WnC3	Slight	Severe: slope	Slight	Moderate: low strength.	Slight	Moderate: slope; low strength.
WbD, WnD3	Moderate: slope.	Severe: slope	Moderate: slope.	Moderate: slope; low strength.	Moderate: slope.	Moderate: slope; low strength.
WbE	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Whitwell:						
Wt, flooded	Severe: wetness; floods.	Severe: wetness; floods.	Severe: floods	Severe: floods	Severe: wetness; floods.	Severe: floods
Wt, nonflooded	Severe: wetness	Severe: wetness	Moderate: wetness.	Moderate: wetness.	Severe: wetness	Moderate: low strength.

soils, and on experience with the same kinds of soil in other counties. Following are explanations of some of the columns in table 8.

Depth to seasonal high water table is the distance from the surface of the soil to the highest level that ground water reaches in most years.

Depth to rock is the distance from the surface of the soil to the upper surface of the rock layer.

Soil texture is described in table 8 in the standard terms used by the Department of Agriculture. These terms take into account relative percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the soil contains gravel or other particles coarser than sand, an appropriate modifier is added; for example, "gravelly loamy sand." "Sand," "silt," and "clay" are some of the other terms that are used in USDA textural classification and are defined in the Glossary.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from semisolid to plastic. If the moisture content is further increased, the material changes from plastic to liquid. The plastic limit is the moisture content at which the soil material changes from a semisolid to plastic, and the liquid limit from plastic to liquid. The plasticity index is the numerical difference between the liquid limit and the plastic limit.

Permeability is the quality that enables a soil to transmit water or air. It is estimated on the basis of soil characteristics observed in the field, particularly structure and texture. The estimates in table 8 do not take into account lateral seepage or such transient soil features as plowpans and surface crusts.

Available water capacity is the ability of soils to hold water for use by most plants. It is commonly defined as the difference between the amount of water in

of engineering properties—Continued

Suitability as source of—		Soil features affecting—			
Road fill	Topsoil	Pond reservoir areas	Embankments, dikes, and levees	Drainage of cropland and pasture	Terraces and diversions
Poor: low strength; slope.	Poor: thin layer; too clayey; area reclaim.	Depth to rock; slope.	Unstable fill; thin layer; hard to pack.	Not needed	Slope; depth to rock.
Poor: low strength	Fair: slope; thin layer.	Seepage	Compressible; unstable fill	Not needed	Slope.
Poor: low strength; slope.	Poor: slope	Slope; seepage	Compressible; unstable fill	Not needed	Slope.
Fair: low strength	Good	Seepage	Compressible; seepage; piping	Not needed	Not needed.
Poor: slope; thin layer.	Poor: slope; small stones.	Seepage; depth to rock; slope.	Seepage; piping; thin layer	Not needed	Slope; depth to rock.
Poor: slope; thin layer.	Poor: slope; small stones.	Seepage; depth to rock; slope.	Seepage; piping; thin layer	Not needed	Slope; depth to rock.
Fair: low strength	Fair: thin layer	Seepage	Compressible; hard to pack	Not needed	Favorable.
Fair: low strength	Fair: thin layer	Seepage	Compressible; hard to pack	Not needed	Slope.
Fair: low strength; slope.	Poor: slope	Seepage	Compressible; hard to pack	Not needed	Slope.
Poor: slope	Poor: slope	Seepage; slope	Compressible	Not needed	Slope.
Fair: low strength	Good	Seepage	Piping	Floods	Not needed.
Fair: low strength	Good	Seepage	Piping	Favorable	Not needed.

the soil at field capacity and the amount at the wilting point of most crops.

Reaction is the degree of acidity or alkalinity of a soil, expressed in pH values. Terms used to describe soil reaction are explained in the Glossary.

Shrink-swell potential is the relative change in volume to be expected of soil material with changes in moisture content, that is, the extent to which the soil shrinks when dry or swells when wet. The extent of shrinking and swelling is influenced by the amount and kind of clay in the soil. Shrinking and swelling of soils cause much damage to building foundations, roads, and other structures. A *high* shrink-swell potential indicates a hazard to maintenance of structures built in, on, or with material having this rating.

Engineering interpretations

The interpretations in table 9 are based on the engineering properties of soils in table 8 and on the experience of engineers and soil scientists with the soils in Monroe County. In table 9, ratings are used to summarize the limitation or suitability of the soils for all listed purposes except drainage of cropland and pasture, ponds and reservoirs, embankments, and terraces and diversions. For these particular uses, table 9 lists those features not to be overlooked in design, installation, and maintenance.

Soil limitations are expressed as slight, moderate, and severe. *Slight* means that soil properties are generally favorable for the rated use or in other words, that limitations are minor and easily overcome or modified by special planning and design. *Moderate* means that limitations can normally be overcome by good planning, careful design, and good management. *Severe* means that soil properties are so unfavorable and so difficult to correct or overcome that major soil reclamation, special designs, or intensive maintenance is required.

Soil suitability is expressed as good, fair, and poor, which have, respectively, meanings approximately parallel to the terms slight, moderate, and severe.

Following are explanations of some of the columns in table 9.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into natural soil. The soil material between depths of 18 inches and 6 feet is evaluated. The soil properties considered are those that affect both absorption of effluent and construction and operation of the system. Properties that affect absorption are permeability, depth to water table or rock, and susceptibility to flooding. Slope is a soil property that affects layout and construction and increases the risk of soil erosion, lateral seepage, and downslope flow of effluent. Large rocks or boulders increase construction costs.

Sewage lagoons are shallow ponds constructed to hold sewage within a depth of 2 to 5 feet long enough for bacteria to decompose the soils. A lagoon has a nearly level floor and sides, or embankments, of compacted soil material. The assumption is made that the embankment is compacted to medium density and the pond is protected from flooding. Properties are considered that affect the pond floor and the embankment. Those that affect the pond floor are permeability, organic matter, and slope. If the floor needs to be leveled, depth to bedrock becomes important. Properties that affect the embankment are the engineering properties of the embankment material, as interpreted from the Unified soil classification system, and the amount of stones, if any, that influence the ease of excavation and compaction of the embankment material.

Shallow excavations are those that require digging or trenching to a depth of less than 6 feet, for example, excavations for pipelines, sewerlines, phone and power transmission lines, basements, and open ditches. Desirable soil properties are good workability, moderate resistance to sloughing, gentle slopes, no rock outcrops or big stones, and no flooding or high water table.

Dwellings without basements, as rated in table 9, are no more than three stories high and are supported by foundation footings placed in undisturbed soil. Features that affect the rating of a soil for dwellings are those that relate to capacity to support load and resist settlement under load, and those that relate to ease of excavation. Soil properties that affect capacity to support load are wetness, susceptibility to flooding, density, plasticity, texture, and shrink-swell potential. Those that affect excavation are wetness, slope, depth to bedrock, and content of stones and rocks.

Sanitary landfill is a method of disposing of refuse in dug trenches. The waste is spread in thin layers, compacted, and covered with soil throughout the disposal period. Landfill areas are subject to heavy vehicular traffic. Some soil properties that affect suitability for landfill are ease of excavation, hazard of polluting ground water, and trafficability. The best soils have moderately slow permeability, withstand heavy traffic, are friable, and are easy to excavate. Unless otherwise stated, the ratings in table 9 apply only to a depth of about 6 feet. Limitation ratings of *slight* or *moderate* therefore may not be valid if trenches are to be much deeper. For some soils, reliable predictions can be made to a depth of 10 to 15 feet, but onsite investigation is needed.

Local roads and streets, as rated in table 9, have an all weather surface expected to carry automobile traffic all year. They have a subgrade of underlying soil material; a base consisting of gravel, crushed rock, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. These roads are graded to shed water and have ordinary provisions for drainage. They are built mainly from soil at hand. Most cuts and fills are less than 6 feet deep.

Soil properties that most affect design and construction of roads and streets are load-supporting capacity and stability of the subgrade, and the workability and quantity of cut and fill material available. The AASHTO and Unified classifications of the soil material, and also the shrink-swell potential, indicate traffic-supporting capacity. Wetness and flooding affect stability of the material. Slope, depth to hard rock, content of stones and rocks, and wetness affect the ease of excavation and the amount of cut and fill needed to reach and even grade.

Road fill is soil material used in embankments for roads. The suitability ratings reflect the predicated performance of soil after it has been placed in an embankment that has been properly compacted and provided with adequate drainage, and the relative ease of excavating the material at borrow areas.

Topsoil is used for topdressing an area where vegetation is to be established and maintained. Suitability is affected mainly by the ease of working and spreading the soil material, as in preparing a seedbed; the natural fertility of the material, or its response to plants when fertilizer is applied; and the absence of substances toxic to plants. Texture of the soil material and its content of stone fragments are characteristics that affect suitability. Also considered in the ratings is damage that will result in the area from which the topsoil is taken.

Pond reservoirs hold water behind a dam or embankment. Soils suitable as pond reservoir areas have low seepage, which is related to their permeability and depth to fractured or permeable bedrock or other permeable material.

Embankments, dikes, and levees require soil material resistant to seepage and piping and of favorable stability, shrink-swell potential, shear strength, and compactibility. Stones and organic material are among features that are unfavorable.

Drainage for crops and pasture is affected by such properties as permeability, texture, and structure; depth to claypan, rock, or other layers that influence rate of water movement; depth to the water table; slope; stability in ditchbanks; susceptibility to stream overflow; salinity or alkalinity; and availability of outlets for drainage.

Terraces and diversions are embankments, or ridges, constructed across the slope to intercept runoff so that it soaks into the soil or flows slowly to a prepared outlet. Features that affect suitability of a soil for terraces are uniformity and steepness of slope; depth to bedrock or other unfavorable material; stones; permeability; and resistance to water erosion, soil slipping, and soil blowing. A soil suitable for these structures provides outlets for runoff and is not difficult to vegetate.

None of the soils in Monroe County are considered to be a source of sand.

Recreation

Knowledge of soils is necessary in planning, developing, and maintaining areas used for recreation. In table 10, the soils of Monroe County are rated according to limitations that affect their suitability for camp areas, playgrounds, picnic areas, and paths and trails.

Limitations are expressed as slight, moderate, or severe. For all of these ratings, it is assumed that a good cover of vegetation can be established and maintained. A limitation of *slight* means that soil properties are generally favorable and limitations are so minor that they easily can be overcome. A *moderate* limitation can be overcome or modified by planning, by design, or by special maintenance. A *severe* limitation means that costly soil reclamation, special design, intense maintenance, or a combination of these is required.

Camp areas are used intensively for tents and small camp trailers and the accompanying activities of outdoor living. Little preparation of the site is required, other than shaping and leveling for tent and parking areas. Camp areas are subject to heavy foot traffic and limited vehicular traffic. The best soils have mild slopes, good drainage, a surface free of rocks and coarse fragments, no flooding during periods of heavy use, and a surface that is firm after rain but not dusty when dry.

Picnic areas are attractive natural or landscaped tracts that are subject to heavy foot traffic. Most of the vehicular traffic is confined to access roads. The best soils are firm when wet but not dusty when dry, are free from flooding during the season of use, do not have slopes or stones that greatly increase the cost of leveling sites or of building access roads.

Playgrounds are areas used intensively for baseball, football, badminton, and similar organized games. Soils suitable for this use need to withstand intensive foot traffic. The best soils have a nearly level surface free of coarse fragments and rock outcrop, good drainage, no flooding during periods of heavy use, and a surface that is firm after rain but not dusty when dry. If grading and leveling are required, depth to rock is important.

Paths and trails are used for local and cross-country travel by foot or horseback. Design and layout should require little or no cutting and filling. The best soils are at least moderately well drained, are firm when wet but not dusty when dry, are flooded no more than once during the season of use, have slopes of less than 15 percent, and have few or no rocks or stones on the surface.

Formation and Classification of Soils

This part of the survey describes the major factors of soil formation, tells how these factors have affected the soils in Monroe County, and explains some of the principal processes in horizon development. It also defines the system for classifying soils and classifies the soils according to that system.

Factors of Soil Formation

Soil forms through the interaction of five major soil-forming factors—climate, plant and animal life, parent material, relief, and time. The relative influence of each factor varies from place to place.

Climate and vegetation are the active factors that gradually change parent material into soil. Relief modifies the effect of climate and vegetation, mainly by its effect on runoff and temperature. The parent material also affects the kind of soil that forms. Time is needed for parent material to change into soil.

In places one or two of these factors determine most of the local differences in soils. For example, in the valley of Monroe County parent material was the dominant influence in accounting for differences in the soils. In the mountains, the dominant factors were parent material, climate, and relief.

Climate

The climate of Monroe County is varied and is influenced somewhat by the differences in relief. In the Great Valley part of the county, where the climate is humid temperate, summers are hot. In the mountainous areas, summers are cool. Temperatures at the higher elevations generally are 10° to 15° F lower than those in the valley. Annual precipitation in the higher mountains is generally 75 to 80 inches.

In the Great Valley areas the average annual temperature is about 60°, ranging from 40° in January to 78° in July. Extreme temperature readings of approximately 100° in July and below 0° in January have been recorded. Normal annual precipitation is about 45 inches. The heavest rain occurs in late winter or early spring. A more complete discussion of the climate is given in the section "General Nature of the County."

The cool climate of the mountainous area is not conducive to rapid soil formation. At the higher elevations the soils remain frozen most of the winter. Leaching and soil development are limited during this period. Plant remains decompose slowly and the release and movement of organic acid is reduced. The soils are darker as content of organic matter increases under these conditions. The formation and movement of clay is limited, and most soils are not high in clay. Most of the soils are either shallow or only moderately thick, except on foot slopes, concave slopes, and benches and along drainageways.

Local differences in soils are caused by microrelief, slope, aspect, and drainage. On the steep south- and west-facing slopes annual and daily temperatures are higher, organic matter decays faster, and the freeze-thaw ratio is higher than on the north- and east-facing slopes. Because the freeze-thaw ratio is higher, there is more creep and erosion on the south- and west-facing slopes. Consequently, the soils are shallower, have more rock outcrop, and are less productive than the soils on the north- and east-facing slopes.

TABLE 10.—*Limitations for recreational development*

Soil series and map symbols	Camp areas	Picnic areas	Playgrounds	Paths and trails
Alcoa:				
AaB	Slight	Slight	Moderate: slope	Slight.
AaC, AcC3	Slight	Slight	Severe: slope	Slight.
AaD, AcD3	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope.
Allegheny: Ag	Moderate: floods	Slight	Slight	Slight.
Allen:				
AnC	Slight	Slight	Severe: slope	Slight.
AnD	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
Altavista: As	Severe: floods	Moderate: wetness; floods	Moderate: wetness; floods	Slight.
Atkins: At	Severe: wetness; floods	Severe: wetness; floods	Severe: wetness; floods	Severe: wetness; floods.
Beason: Ba	Moderate: wetness; floods	Moderate: wetness; floods	Moderate: wetness; floods	Moderate: wetness; floods.
Bland:				
BdD	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
BdE	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
BnE	Severe: slope; rock outcrop	Severe: slope; rock outcrop	Severe: slope; rock outcrop	Severe: slope; rock outcrop.
Brookshire: BrE	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Calvin:				
CaD	Moderate: slope	Moderate: slope	Severe: slope	Slight.
CaE	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Cataska: CcF	Severe: slope; rock outcrop	Severe: slope; rock outcrop	Severe: slope; rock outcrop	Severe: slope; rock outcrop.
Chagrin: Cg	Severe: floods	Moderate: floods	Moderate: floods	Slight.
Christian:				
ChC	Slight	Slight	Severe: slope	Slight.
ChD, CnD3	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
Citico: CtE	Severe: slope	Severe: slope	Severe: slope; small stones	Severe: slope.
Dandridge:				
DaD	Moderate: slope	Moderate: slope	Severe: slope; depth to rock	Slight.
DaE, DaF	Severe: slope	Severe: slope	Severe: slope; depth to rock	Severe: slope.
Decatur:				
DcB	Slight	Slight	Moderate: slope	Slight.
DcC	Slight	Slight	Severe: slope	Slight.
DcD2	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope.
DdC3	Moderate: too clayey	Moderate: too clayey	Severe: slope	Moderate: too clayey.
DdD3	Moderate: slope; too clayey	Moderate: slope; too clayey	Severe: slope	Moderate: slope.
Dewey:				
DeB	Slight	Slight	Moderate: slope	Slight.
DeC	Slight	Slight	Severe: slope	Slight.
DeD2	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope.
DgC3	Moderate: too clayey	Moderate: too clayey	Severe: slope	Moderate: too clayey.
DgD3	Moderate: slope; too clayey	Moderate: slope; too clayey	Severe: slope	Moderate: slope; too clayey.
Ditney:				
DhD	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
DhF	Severe: slope	Severe: slope	Severe: slope	Severe: slope.

Dunmore:				
DmB	Slight	Slight	Moderate: slope	Slight.
DmC	Slight	Slight	Severe: slope	Slight.
DmD2	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope.
DmE2	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
DnC3	Moderate: too clayey	Moderate: too clayey	Severe: slope	Moderate: too clayey.
DnD3	Moderate: slope; too clayey	Moderate: slope; too clayey	Severe: slope	Moderate: slope; too clayey.
Dunning: Du	Severe: wetness; floods	Severe: wetness	Severe: wetness	Severe: wetness.
Emory: Em	Severe: floods	Slight	Moderate: floods	Slight.
Etowah:				
EtB	Slight	Slight	Moderate: slope	Slight.
EtC	Slight	Slight	Severe: slope	Slight.
EtD	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope.
Farragut:				
FaC2	Slight	Slight	Severe: slope	Slight.
FgD3	Severe: too clayey	Severe: too clayey	Severe: slope; too clayey	Severe: too clayey.
Fletcher:				
FhC	Slight	Slight	Severe: slope	Slight.
FhD	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope.
Fullerton:				
FtC	Moderate: small stones	Moderate: small stones	Severe: slope; small stones	Moderate: small stones.
FtD	Moderate: slope; small stones	Moderate: slope; small stones	Severe: slope; small stones	Moderate: small stones.
FtE	Severe: slope	Severe: slope	Severe: slope; small stones	Severe: slope.
Gladeville: GdD	Severe: small stones; rock outcrop.	Moderate: small stones; rock outcrop.	Severe: slope; depth to rock; small stones.	Moderate: rock outcrop; small stones.
Greendale: Gr	Severe: floods	Moderate: floods	Moderate: floods	Slight.
Hamblen: Ha	Severe: floods	Moderate: floods	Moderate: floods	Slight.
Hartsells: HeC	Moderate: slope	Moderate: slope	Severe: slope	Slight.
Holston: HoC	Slight	Slight	Severe: slope	Slight.
Jefferson:				
JeC	Slight	Slight	Severe: slope	Slight.
JeD	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
JeE	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
JfD	Severe: slope; small stones	Severe: slope; small stones	Severe: slope; small stones	Moderate: small stones; slope.
JfE	Severe: slope; small stones	Severe: slope; small stones	Severe: slope; small stones	Severe: slope.
Jeffrey:				
JyD	Severe: slope	Severe: slope	Severe: slope; small stones	Moderate: slope.
JyF	Severe: slope	Severe: slope	Severe: slope; small stones	Severe: slope.
Leadvale: LeB	Moderate: percs slowly	Slight	Moderate: slope; percs slowly	Slight.
Linker: LkC	Slight	Slight	Severe: slope	Slight.
Litz:				
LtC	Slight	Slight	Severe: slope	Slight.
LtD, LtD3	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope.
LtE	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
LY For Sequoia part of LY, see Sequoia series.	Severe: gullies; slope; too clayey.	Severe: gullies; slope; too clayey.	Severe: gullies; slope; too clayey.	Severe: gullies; slope; too clayey.
Lobdell: Lz	Severe: floods	Moderate: floods	Moderate: floods	Slight.

TABLE 10.—*Limitations for recreational development*—Continued

Soil series and map symbols	Camp areas	Picnic areas	Playgrounds	Paths and trails
Minvale:				
MnB	Slight	Slight	Moderate: slope	Slight.
MnC	Slight	Slight	Severe: slope	Slight.
Montevallo: MtE	Severe: slope	Severe: slope	Severe: slope; depth to rock; small stones.	Moderate: slope.
Neubert: Ne	Severe: floods	Slight	Slight	Slight.
Newark: Nk	Severe: floods; wetness	Moderate: wetness; floods	Moderate: wetness; floods	Moderate: wetness.
Philo: Ph	Severe: floods	Moderate: floods	Moderate: floods	Slight.
Pope: Po	Severe: floods	Moderate: floods	Moderate: floods	Slight.
Purdy: Pu	Severe: floods; wetness	Moderate: wetness; floods	Moderate: wetness; floods	Severe: wetness.
Ramsey: RaF	Severe: slope; large stones	Severe: slope; large stones	Severe: slope; large stones	Severe: slope; large stones.
Ranger:				
RgD	Severe: slope	Severe: slope	Severe: slope; small stones	Moderate: slope.
RgF	Severe: slope	Severe: slope	Severe: slope; small stones	Severe: slope.
Sequatchie: Sa	Severe: floods	Moderate: floods	Moderate: slope; floods	Slight.
Sequoia:				
SeB	Moderate: percs slowly	Slight	Moderate: slope; percs slowly	Slight.
SeC2, SeD2	Moderate: slope	Moderate: slope	Severe: slope	Slight.
SgC3, SgD3	Severe: too clayey	Severe: too clayey	Severe: slope; too clayey	Severe: too clayey.
Shelocta:				
ShC	Slight	Slight	Severe: slope	Slight.
ShD	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
Shouns: SnD	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
Spivey: SpF	Severe: slope; large stones	Severe: slope; large stones	Severe: slope; large stones	Severe: slope; large stones.
Staser: Ss	Severe: floods	Moderate: floods	Moderate: floods	Slight.
Statler: St	Slight	Slight	Moderate: slope	Slight.
Steekee: SvF	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Sylco: SyF	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Talbott:				
TaC2	Slight	Slight	Severe: slope	Slight.
TbC3, TbD3	Severe: too clayey	Severe: too clayey	Severe: slope; too clayey	Severe: too clayey.
TaD2	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope,
TcD, TcE	Severe: slope; rock outcrop	Severe: slope; rock outcrop	Severe: slope; rock outcrop	Severe: slope; rock outcrop.
Tellico:				
TeD	Moderate: slope	Moderate: slope	Severe: slope	Slight.
TeE, TeF, ToE3	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
ToD3	Moderate: slope; too clayey	Moderate: slope; too clayey	Severe: slope; too clayey	Moderate: too clayey.
TS For Dewey part of TS, see Dewey series.	Severe: slope; too clayey; gullies.	Severe: slope; too clayey; gullies.	Severe: slope; too clayey; gullies.	Severe: slope; too clayey; gullies.

Transylvania: Ty	Severe: floods.	Moderate: floods.	Moderate: floods.	Slight.
Unicoi: UcF	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Wallen: WaF	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Waynesboro:				
WbB	Slight.	Slight.	Moderate: slope.	Slight.
WbC	Slight.	Slight.	Severe: slope.	Slight.
WbD	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
WbE	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
WnC3	Moderate: too clayey.	Moderate: too clayey.	Severe: slope.	Moderate: too clayey.
WnD3	Moderate: slope; too clayey.	Moderate: slope; too clayey.	Severe: slope.	Moderate: slope; too clayey.
Whitwell: Wt	Slight.	Slight.	Slight.	Slight.

The warm moist climate of the valley promotes rapid soil formation. The temperature encourages rapid chemical reaction. Large amounts of water move through the soil and remove dissolved or suspended material. Plant remains decompose rapidly, and the organic acids have hastened the development of clay minerals and the removal of carbonates. Leaching and soil development continue all year because the soil is frozen for only short periods, and then to a depth of no more than 5 or 6 inches.

Plant and animal life

All living organisms are important to soil formation, including vegetation, animals, bacteria, and fungi. The vegetation generally determines the amount of organic matter, the color of the surface layer, and the amount of nutrients. Animals, such as earthworms, cicada, and burrowing animals, keep the soil open and porous. Bacteria and fungi decompose the vegetation, thus releasing nutrients for plant food. In Monroe County, the native forests have had more influence on soil formation than any other living organism. At the higher elevations the vegetation approaches northern hardwoods. Through the mid elevations, forests consist of mixed mesophytic types. In the valley and at lower elevations, forests were mainly oak-hickory. Man, however, has greatly influenced the surface layer where forests have been cleared and the land plowed. He has added fertilizers, mixed some of the soil horizons, and moved the soil material from place to place.

Parent material

Parent material is the unconsolidated mass from which the soils formed. It influences mineralogical and chemical composition of the soil and, to a large extent, the rate at which soil-forming processes take place.

In Monroe County, soils formed in material derived from limestone, shale, sandstone, siltstone, phyllite, schist, and possibly granite. Colluvium, material moved by gravity, is an important parent material on foot slopes and on certain mountainsides. Alluvium, material moved by water, is a dominant parent material along most of the streams and on terraces where there are remnants of old flood plain deposits. Both colluvium and alluvium can contain minerals from several rock sources. Dunmore and Fullerton soils are examples of soils that formed, respectively, over acid and calcareous shale. The Staser and Transylvania soils on bottom land formed in alluvium from many sources.

Relief

Monroe County is in the Great Valley of East Tennessee and the mountainous Blue Ridge Province. Approximately 56 percent of the county lies in the valley and 44 percent in the Unaka Mountains. A succession of parallel ridges and narrow intervening valleys extends through the county in a southwest to northeast direction. Many different kinds of soils are in this ridge and valley landscape.

The Great Valley rises from about 750 feet above sea level near the Little Tennessee River to more than 1,250 feet on the higher ridgecaps. In places, there is as much as a 200- to 300-foot difference in elevation in less than a mile. Upland slopes are gently sloping or sloping in the major part of the valley, but are moderately steep on side slopes in some areas.

Within the mountainous area the elevation ranges from 1,000 feet east of Tellico to 5,000 feet near the North Carolina line. Differences in elevation are as much as 2,000 feet in less than a mile. The broader ridgecaps are sloping and moderately steep, and steep side slopes lead to narrow valleys below.

The shape of the land surface, lay of the land, or relief has had great influence on the formation of the soils, particularly in the mountainous area. Indirectly, it affects the temperature and, in turn, plant life. Soils that formed on sloping topography where runoff is moderate to rapid generally are well drained; have a bright colored, unmottled subsoil; and in most places are leached to a greater depth than wetter soils in the same general area. Examples are Alcoa, Decatur, and Etowah soils in the valley and Fletcher, Shouns, and Shelocta soils in the mountains. In more gently sloping or nearly level areas where runoff is slower, the soils frequently show some evidence of wetness for short periods, such as mottling in the subsoil. Leadvale, Whitwell, Beason, and Altavista soils are examples. In level areas or slight depressions, where the water table is at or near the surface for long periods, the soils show evidence of wetness. They have a dark colored, thick surface layer and a strongly mottled or grayish subsoil. Hamblen, Philo, Newark, Atkins, and Purdy soils are examples. Also, the permeability of the material, as well as the length, steepness, and shape of the slopes, influence the kind of soil that forms.

Time

Formation of the soils requires time for changes to take place in the parent material, ordinarily a long time. Differences in time that parent material has been in place are commonly reflected in the degree of horizon formation in the soils.

Most of the soils in the valley are old and have well defined horizons. A few of the soils are young, in the mountains and along streams and drainageways in the valley. They have faint horizons.

Neubert and Alcoa soils, for example, differ mainly because of differences in time. Neubert soils formed in alluvium, but lack strongly developed horizons because the material has been in place only a relatively short time. Alcoa soils, which are intermediate in age, have been in place long enough for stronger horizons to form. Their B horizon is redder and more clayey than the A horizon. The carbonates have leached out, and the soil is strongly acid in contrast with the slightly leached Neubert soils, which are slightly acid or medium acid.

Classification of the Soils

Classification consists of an orderly grouping of soils according to a system designed to make it easier to remember soil characteristics and interrelationships. Classification is useful in organizing and applying the results of experience and research. Soils are placed in narrow classes for discussion in detailed soil surveys and for application of knowledge within farms and fields. The many thousands of narrow classes are then grouped into progressively fewer and broader classes in successively higher categories, so that information can be applied to large geographic areas.

Two systems of classifying soils have been used in the United States in recent years. The older system was adopted in 1938 and revised later (*5*). The system currently used by National Cooperative Soil Survey was developed in the early sixties and adopted in 1965 (*6*) and is under continual study.

The current system of classification has six categories (*4*). Beginning with the most inclusive, these categories are the order, the suborder, the great group, the subgroup, the family, and the series. The criteria for classification are soil properties that are observable or measurable, but the soil properties are selected so that soils of similar formation are grouped together. The placement of some soil series in the current system of classification, particularly in families, may change as more precise information becomes available.

Table 11 shows the classification of each soil series in Monroe County by family, subgroup, and order according to the current system. Following are brief descriptions of each of the categories of the current system.

Order.—Ten soil orders are recognized in the current system of classification. They are Alfisols, Aridisols, Entisols, Histosols, Inceptisols, Mollisols, Oxisols, Spodosols, Ultisols, and Vertisols. The properties used to differentiate the soil orders are those that tend to give broad climatic groupings of soils. Three exceptions are Entisols, Histosols, and Inceptisols, which occur in many climates. Five soil orders are represented in Monroe County. They are Alfisols, Entisols, Inceptisols, Mollisols, and Ultisols.

Suborder.—Each order is divided into suborders, based primarily on soil characteristics that produce classes having genetic similarity. A suborder has a narrower climatic range than an order. The criteria for suborders reflect either the presence or absence of waterlogging or soil differences resulting from climate or vegetation.

Great group.—Each suborder is divided into great groups on the basis of uniformity in the kind and sequence of genetic horizons.

Subgroup.—Each great group is divided into subgroups, one representing the central (typic) concept of the great groups, and others, called intergrades, made up of soils that have mostly the properties of one great group but also one or more properties of another great group.

Family.—Families are established within a subgroup, mainly on the basis of properties important to plant growth. Some of these properties are texture, mineralogy, reaction, soil temperature, permeability, consistence, and thickness of horizons.

TABLE 11.—*Soil series classified by higher categories*

Series	Family	Subgroup	Order
Alcoa	Clayey, oxidic, thermic	Rhodic Paleudults	Ultisols.
Allegheny	Fine-loamy, mixed, mesic	Typic Hapludults	Ultisols.
Allen	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Altavista	Fine-loamy, mixed, thermic	Aquic Hapludults	Ultisols.
Atkins	Fine-loamy, mixed, acid, mesic	Typic Fluvaquents	Entisols.
Beason	Clayey, mixed, thermic	Aquic Hapludults	Ultisols.
Bland	Fine, mixed, mesic	Typic Hapludalfs	Alfisols.
Brookshire	Coarse-loamy, mixed, mesic	Umbric Dystrochrepts	Inceptisols.
Calvin	Loamy-skeletal, mixed, mesic	Typic Dystrochrepts	Inceptisols.
Cataska	Loamy-skeletal, mixed, mesic, shallow	Typic Dystrochrepts	Inceptisols.
Chagrin	Fine-loamy, mixed, mesic	Dystric Fluventic Eutrochrepts	Inceptisols.
Christian	Clayey, kaolinitic, mesic	Typic Hapludults	Ultisols.
Citico	Fine-loamy, mixed, mesic	Typic Dystrochrepts	Inceptisols.
Dandridge	Clayey-skeletal, mixed, mesic	Lithic Ruptic-Alfic Eutrochrepts	Inceptisols.
Decatur	Clayey, kaolinitic, thermic	Rhodic Paleudults	Ultisols.
Dewey	Clayey, kaolinitic, thermic	Typic Paleudults	Ultisols.
Ditney	Coarse-loamy, mixed, mesic	Typic Dystrochrepts	Inceptisols.
Dunmore	Clayey, kaolinitic, mesic	Typic Paleudults	Ultisols.
Dunning	Fine, mixed, mesic	Fluvaquentic Haplaquolls	Mollisols.
Emory	Fine-silty, siliceous, thermic	Fluventic Umbric Dystrochrepts	Inceptisols.
Etowah	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Farragut	Clayey, mixed, thermic	Humic Hapludults	Ultisols.
Fletcher	Fine-silty, mixed, mesic	Typic Hapludults	Ultisols.
Fullerton	Clayey, kaolinitic, thermic	Typic Paleudults	Ultisols.
Gladeville	Clayey-skeletal, mixed, thermic	Lithic Rendolls	Mollisols.
Greendale	Fine-loamy, siliceous, mesic	Fluventic Dystrochrepts	Inceptisols.
Hamblen	Fine-loamy, siliceous, thermic	Fluvaquentic Eutrochrepts	Inceptisols.
Hartsells	Fine-loamy, siliceous, thermic	Typic Hapludults	Ultisols.
Holston	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Jefferson	Fine-loamy, siliceous, mesic	Typic Hapludults	Ultisols.
Jeffrey	Coarse-loamy, mixed, mesic	Umbric Dystrochrepts	Inceptisols.
Leadvale	Fine-silty, siliceous, thermic	Typic Fragiudults	Ultisols.
Linker	Fine-loamy, siliceous, thermic	Typic Hapludults	Ultisols.
Litz	Loamy-skeletal, mixed, mesic	Ruptic-Ultic Dystrochrepts	Inceptisols.
Lobdell	Fine-loamy, mixed, mesic	Fluvaquentic Eutrochrepts	Inceptisols.
Minvale[1]	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Montevallo	Loamy-skeletal, mixed, thermic, shallow	Typic Dystrochrepts	Inceptisols.
Neubert	Fine-loamy, siliceous, nonacid, thermic	Typic Udifluvents	Entisols.
Newark	Fine-silty, mixed, nonacid, mesic	Aeric Fluvaquents	Entisols.
Philo	Coarse-loamy, mixed, mesic	Fluvaquentic Dystrochrepts	Inceptisols.
Pope	Coarse-loamy, mixed, mesic	Fluventic Dystrochrepts	Inceptisols.
Purdy	Clayey, mixed, mesic	Typic Ochraquults	Ultisols.
Ramsey	Loamy, siliceous, mesic	Lithic Dystrochrepts	Inceptisols.
Ranger	Loamy-skeletal, mixed, mesic	Ruptic-Ultic Dystrochrepts	Inceptisols.
Sequatchie	Fine-loamy, siliceous, thermic	Humic Hapludults	Ultisols.
Sequoia	Clayey, mixed, mesic	Typic Hapludults	Ultisols.
Shelocta	Fine-loamy, mixed, mesic	Typic Hapludults	Ultisols.
Shouns	Fine-loamy, mixed, mesic	Typic Hapludults	Ultisols.
Spivey	Loamy-skeletal, mixed, mesic	Typic Haplumbrepts	Inceptisols.
Staser	Fine-loamy, mixed, thermic	Cumulic Hapludolls	Mollisols.
Statler	Fine-loamy, mixed, thermic	Humic Hapludults	Ultisols.
Steekee	Loamy, siliceous, thermic, shallow	Ruptic-Ultic Dystrochrepts	Inceptisols.
Sylco	Loamy-skeletal, mixed, mesic	Typic Dystrochrepts	Inceptisols.
Talbott	Fine, mixed, thermic	Typic Hapludalfs	Alfisols.
Tellico	Clayey, oxidic, thermic	Typic Rhodudults	Ultisols.
Transylvania	Fine-loamy, mixed, mesic	Cumulic Haplumbrepts	Inceptisols.
Unicoi	Loamy-skeletal, mixed, mesic	Lithic Dystrochrepts	Inceptisols.
Wallen	Loamy-skeletal, siliceous, mesic	Typic Dystrochrepts	Inceptisols.
Waynesboro	Clayey, kaolinitic, thermic	Typic Paleudults	Ultisols.
Whitwell	Fine-loamy, siliceous, thermic	Aquic Hapludults	Ultisols.

[1] The Minvale soils of Monroe County are taxadjuncts to the series. They are slightly less than 15 percent coarse fragments, but are otherwise within the range of the series.

References

(1) AMERICAN ASSOCIATION OF STATE HIGHWAY [AND TRANSPORTATION] OFFICIALS.
1961. STANDARD SPECIFICATIONS FOR HIGHWAY MATERIALS AND METHODS OF SAMPLING AND TESTING. Ed. 8, 2 vol., illus.

(2) AMERICAN SOCIETY FOR TESTING AND MATERIALS.
1974. METHOD FOR CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES. ASTM Stand. D. 2487-69. *In* 1974 Annual Book of ASTM Standards, Part 19, 464 pp., illus.

(3) FOSTER, AUSTIN P.
1923. COUNTIES OF TENNESSEE. Tenn. Dept. of Education, Div. of History, 124 pp.

(4) SIMONSON, ROY W.
1962. SOIL CLASSIFICATION IN THE UNITED STATES. Soil Sci. 137: 1027-1034, illus.

(5) THORP, JAMES AND SMITH, GUY D.
1949. HIGHER CATEGORIES OF SOIL CLASSIFICATION: ORDER, SUBORDER, AND GREAT SOIL GROUP. Soil Sci. 67: 117-126, illus.

(6) UNITED STATES DEPARTMENT OF AGRICULTURE.
1960. SOIL CLASSIFICATION, A COMPREHENSIVE SYSTEM, 7TH APPROXIMATION. 265 pp., illus. [Supplements issued in March 1967 and September 1968]

(7) UNITED STATES DEPARTMENT OF AGRICULTURE.
1951. SOIL SURVEY MANUAL. U.S. Dep. Agric. Handb. 18, 503 pp., illus. [Supplements replacing pp. 173-188 issued May 1962]

Glossary

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim. An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single mapping unit.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Chert. A structureless form of silica, closely related to flint, that breaks into angular fragments. Soils that develop from impure limestone containing fragments of chert and that have abundant quantities of these fragments in the soil mass are called cherty soils.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the bases of steep slopes.

Compressible. Excessive decrease in volume of soft soil under load.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Creep, soil. Slow mass movement of soil and soil material down relatively steep slopes, primarily under the influence of gravity, but facilitated by saturation with water and by alternate freezing and thawing.

Depth to rock. Bedrock at a depth that adversely affects the specified use.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through elluviation are eluvial; those that have received material are illuvial.

Favorable. Favorable soil features for the specified use.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics, produced by soil-forming processes. The major horizons of mineral soil are as follows:

O horizon.—An organic layer, fresh and decaying plant residue, at the surface of a mineral soil.

A horizon.—The mineral horizon, formed or forming at or near the surface, in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon most of which was originally part of a B horizon.

A2 horizon.—A mineral horizon, mainly a residual concentration of sand and silt high in content of resistant minerals as a result of the loss of silicate clay, iron, aluminum, or a combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or a combination of these; (2) by prismatic or blocky structure; (3) by redder or browner colors than those in the A horizon; or (4) by a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that from which the solum is presumed to have formed. If the material is known to differ from that in the solum the Roman numeral II precedes the letter C.

R Layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Large stones. Rock fragments 10 inches (25 centimeters) or more across. Large stones adversely affect the specified use.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. Inadequate strength for supporting loads.

Microclimate. The climate nature of the air space that extends from the surface to a height where the effects of the immediate character of the underlying surface no longer can be distinguished from the general local climate.

Munsell notation. A designation of color by degrees of the three single variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Parent material. The great variety of unconsolidated organic and mineral material in which soil forms. Consolidated bedrock is not yet parent material by this concept.

Percs slowly. The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality that enables the soil to transmit water or air, measured as the number of inches per hour that water moves through the soil. Terms describing permeability are very slow (less than 0.06 inch), slow (0.06 to 0.20) inch), moderately slow (0.2 to 0.6 inch), moderate (0.6 to 2.0 inches), moderately rapid (2.0 to 6.0 inches), rapid (6.0 to 20 inches), and very rapid (more than 20 inches).

pH value. (See Reaction, soil). A numerical designation of acidity and alkalinity in soil.

Piping. Moving water forms subsurface tunnels or pipelike cavities in the soil.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulates over disintegrating rock.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Second bottom. The first terrace above the normal flood plain of a stream.

Seepage. The rapid movement of water through the soil. Seepage adversely affects the specified use.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Small stones. Rock fragments 3 to 10 inches (7.5 to 25 centimeters) in diameter. Small stones adversely affect the specified use.

Soil. A natural, three-dimensional body at the earth's surface that is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in mature soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristics of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates that are separated from adjoining aggregates. The principal forms of soil structure are—platy (laminated), prismatic (vertical axis of aggregates longer than horizontal), columnar (prisms with rounded tops), blocky (angular or subangular), and granular. Structureless soils are either single grained (each grain by itself, as in dune sand) or massive (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Talus. Fragments of rock and other soil material accumulated by gravity at the foot of cliffs or steep slopes.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. A stream terrace is frequently called a second bottom, in contrast with a flood plain, and is seldom subject to overflow. A marine terrace, generally wide, was deposited by the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are sand, loamy sand, sandy loam, loam, silt, silt loam, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

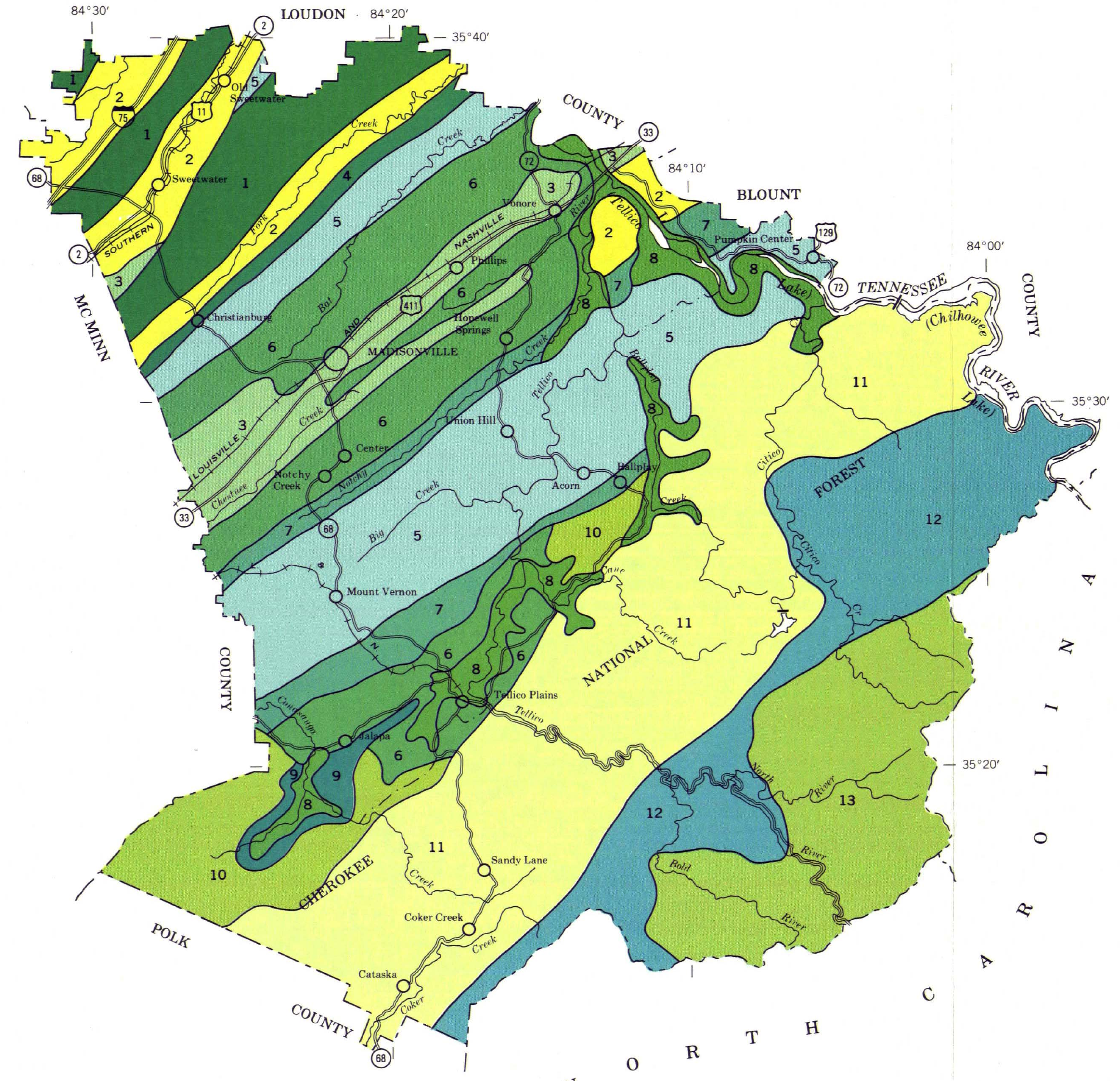
Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1981 -223-758/1042

NRCS Accessibility Statement

This document is not accessible by screen-reader software. The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at ServiceDesk-FTC@ftc.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at http://offices.sc.egov.usda.gov/locator/app.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.


84°30'
LOUDON
84°20'
35°40'
COUNTY
84°10'
BLOUNT
84°00'
TENNESSEE
COUNTY
35°30'
35°20'
MC MINN
COUNTY
POLK
COUNTY
NORTH CAROLINA
CHEROKEE
NATIONAL
FOREST
(Chilhowee
RIVER
Lake)
Tellico
Lake)
Old Sweetwater
Sweetwater
SOUTHERN
NASHVILLE
AND
LOUISVILLE
Christianburg
MADISONVILLE
Vonore
Phillips
Hopewell Springs
Union Hill
Center
Notchy Creek
Acorn
Ballplay
Pumpkin Center
Mount Vernon
Tellico Plains
Jalapa
Sandy Lane
Coker Creek
Cataska
Fork Creek
Bat Creek
Creek
Chestuee
Notchy
Big Creek
Tellico River
Ballplay Creek
Citico Creek
Cane Creek
Conasauga
North River
Bald River
Coker Creek
75
11
411
2
33
72
129
68
1
2
3
4
5
6
7
8
9
10
11
12
13

LEGEND

1	**FULLERTON-MINVALE-GREENDALE** association: Hilly and steep cherty soils, more than 5 feet deep over limestone, on high hills and deep, nearly level to rolling soils on foot slopes and bottom land
2	**DECATUR-DEWEY-EMORY** association: Undulating to hilly soils, more than 5 feet deep over limestone, on low rounded hills and deep, nearly level and undulating soils on bottom land
3	**LITZ-SEQUOIA** association: Undulating to steep soils that have a loamy or clayey subsoil and are 2 to 3 1/2 feet deep over acid shale; on low rounded hills
4	**TALBOTT-GLADEVILLE** association: Rolling to steep soils that have a firm, plastic clayey subsoil and are less than 3 1/2 feet deep over limestone; on low rounded hills
5	**TELLICO-ALCOA-NEUBERT** association: Hilly to very steep soils, 3 1/2 to 5 feet deep over reddish sandy limestone, on high hills and ridges and deep, nearly level to hilly soils on bottom land and foot slopes
6	**DUNMORE-DEWEY** association: Dominantly rolling and hilly soils, more than 5 feet deep over limestone, on low rounded hills
7	**DANDRIDGE** association: Hilly to very steep soils, dominantly 1 to 2 feet deep over calcareous shale, on high winding ridges
8	**STATLER-STASER-TRANSYLVANIA** association: Nearly level and undulating soils, more than 5 feet deep over bedrock, on low terraces and bottom land
9	**CALVIN** association: Rolling to steep soils, 2 to 3 1/2 feet deep over reddish shale, on high hills and knobs
10	**WALLEN-JEFFERSON-RAMSEY** association: Dominantly steep and very steep soils, 1 to more than 6 feet deep over hard sandstone, on high mountainsides
11	**RANGER-CITICO-FLETCHER** association: Steep and very steep soils, 2 to 6 feet deep over phyllite rock, on highly dissected mountains
12	**SYLCO-CITICO-BROOKSHIRE** association: Steep and very steep soils, 2 to 8 feet deep over phyllite and arkosic sandstone rock, on high mountainsides and in deep coves
13	**DITNEY-BROOKSHIRE-JEFFREY** association: Dominantly steep and very steep soils, 2 to 8 feet deep over arkosic sandstone, on high mountainsides and in deep coves

Compiled 1981

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FOREST SERVICE
UNIVERSITY OF TENNESSEE AGRICULTURAL
EXPERIMENT STATION

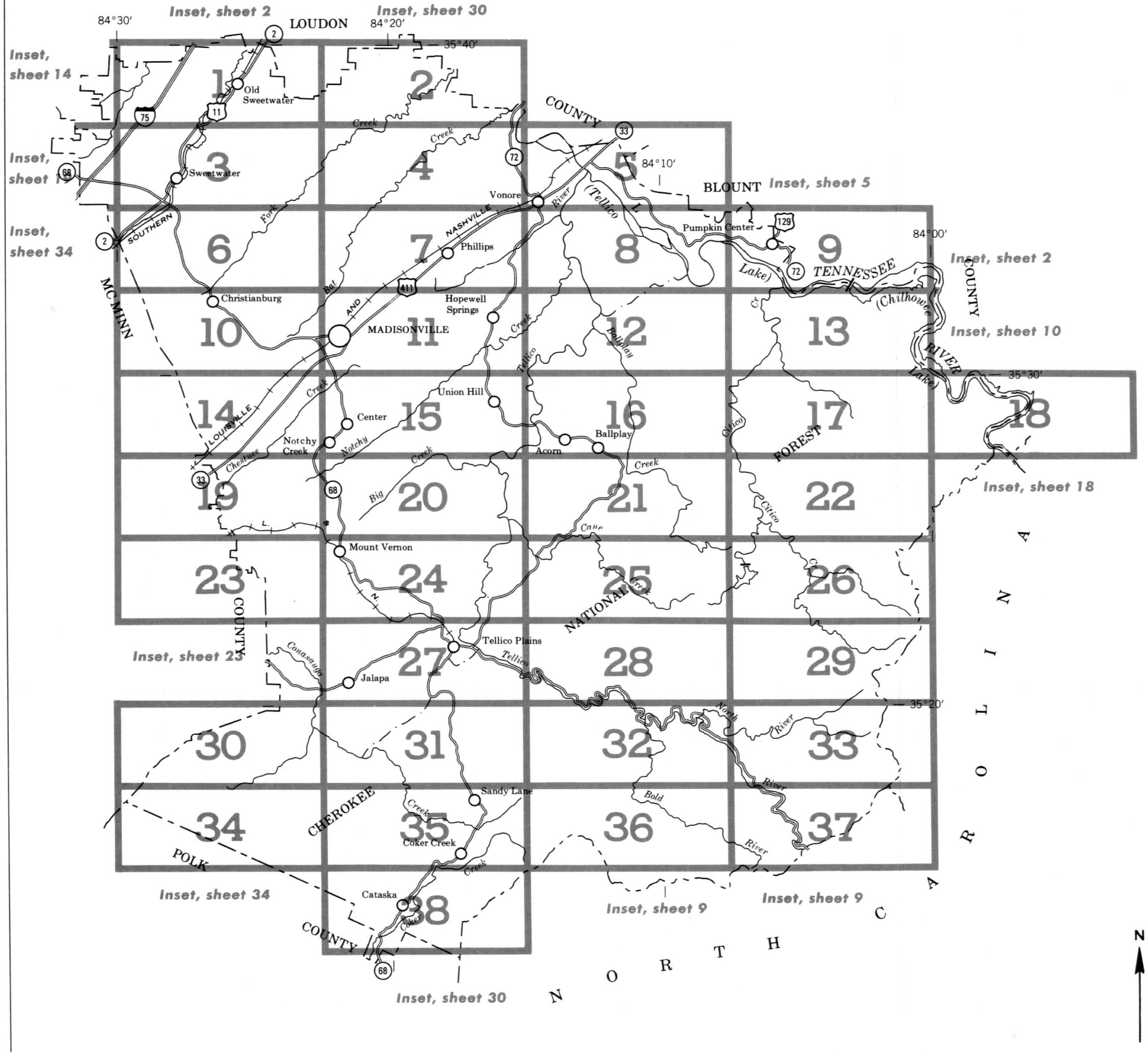
GENERAL SOIL MAP
MONROE COUNTY, TENNESSEE

N

Scale 1:253,440

1 0 1 2 3 4 Miles

1 0 4 8 Km


Inset, sheet 2
Inset, sheet 30
84°30′
LOUDON
84°20′
35°40′
Inset, sheet 14
Inset, sheet 14
Inset, sheet 34
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
Old Sweetwater
Sweetwater
75
11
2
68
33
72
129
411
COUNTY
84°10′
BLOUNT
Inset, sheet 5
Vonore
Phillips
Pumpkin Center
84°00′
Inset, sheet 2
Inset, sheet 10
Inset, sheet 18
COUNTY
TENNESSEE
(Chilhowee
RIVER
Lake)
(Tellico
Lake)
35°30′
SOUTHERN
NASHVILLE
AND
LOUISVILLE
MC MINN
Christianburg
MADISONVILLE
Hopewell Springs
Union Hill
Center
Notchy Creek
Acorn
Ballplay
Mount Vernon
Tellico Plains
Jalapa
Sandy Lane
Coker Creek
Cataska
Fork
Bat
Creek
Ballplay
Tellico
Citico
Notchy
Chestuee
Big
Cane
Conasauga
North
River
Bold
Coker
FOREST
NATIONAL
CHEROKEE
COUNTY
Inset, sheet 23
POLK
COUNTY
Inset, sheet 34
Inset, sheet 30
Inset, sheet 9
Inset, sheet 9
35°20′
N O R T H   C A R O L I N A
N

INDEX TO MAP SHEETS

MONROE COUNTY, TENNESSEE

Scale 1:253,440

1 0 1 2 3 4 Miles

1 0 4 8 Km

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

MONROE COUNTY, TENNESSEE

FOREST SERVICE
UNIVERSITY OF TENNESSEE AGRICULTURAL EXPERIMENT STATION

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label) — Hedley Airstrip

- Small airport, airfield, park, oilfield, cemetery, or flood pool — FLOOD POOL LINE

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate — 21
- Federal — 173
- State — 28
- County, farm or ranch — 1283

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small — water, w

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas) — •
- Church
- School
- Indian mound (label) — Indian Mound
- Located object (label) — Tower
- Tank (label) — Gas
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) — CANAL
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial — water, w
- Intermittent — int, i

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS — CnB WaC2

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

DEPRESSION OR SINK — ◊

SOIL SAMPLE SITE (normally not shown) — Ⓢ

MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic) — ø
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot — +
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot
- Cemeteries < 5 acres — ¤

SOIL LEGEND

The first capital letter is the initial one of the soil name. The second position is a lowercase letter for a narrowly defined unit and a capital letter for a broadly defined unit. The third position, if used, is a capital letter and connotes slope class. Symbols without a slope letter are for level soils or for broadly defined units. A final number, 2 or 3 in the symbol, shows the soil is eroded.

Consecutive capital letters in the map symbol indicate that the composition of the unit is more variable than that of others in the survey area, but has been controlled well enough to be interpreted for the expected use of the soils.

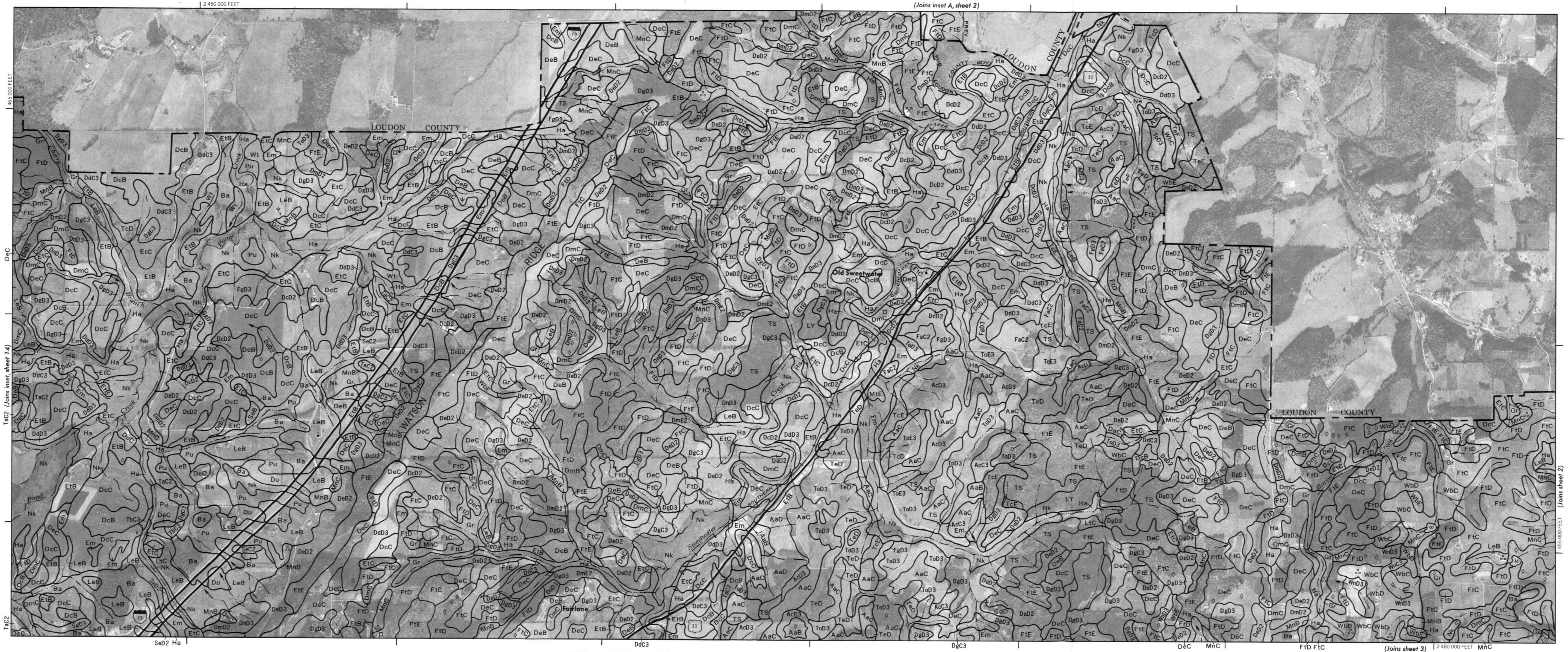
SYMBOL	NAME
AaB	Alcoa loam, 2 to 5 percent slopes
AaC	Alcoa loam, 5 to 12 percent slopes
AaD	Alcoa loam, 12 to 20 percent slopes
AcC3	Alcoa clay loam, 5 to 12 percent slopes, severely eroded
AcD3	Alcoa clay loam, 12 to 20 percent slopes, severely eroded
Ag	Allegheny loam
AnC	Allen loam, 5 to 12 percent slopes
AnD	Allen loam, 12 to 25 percent slopes
As	Altavista silt loam
At	Atkins silt loam
Ba	Beason silt loam
BdD	Bland silt loam, 10 to 25 percent slopes
BdE	Bland silt loam, 25 to 50 percent slopes
BnE	Blank-Rock outcrop complex, 25 to 50 percent slopes
BrE	Brookshire loam, 20 to 40 percent slopes
CaD	Calvin silt loam, 5 to 20 percent slopes
CaE	Calvin silt loam, 20 to 40 percent slopes
CcF	Cataska-Rock outcrop complex, 35 to 75 percent slopes
Cg	Chagrin silt loam
ChC	Christian loam, 3 to 12 percent slopes
ChD	Christian loam, 12 to 25 percent slopes
CnD3	Christian clay loam, 12 to 25 percent slopes, severely eroded
CtE	Citico channery silt loam, 20 to 40 percent slopes
DaD	Dandridge shaly silty clay loam, 5 to 20 percent slopes
DaE	Dandridge shaly silty clay loam, 20 to 35 percent slopes
DaF	Dandridge shaly silty clay loam, 35 to 60 percent slopes
DcB	Decatur silt loam, 2 to 5 percent slopes
DcC	Decatur silt loam, 5 to 12 percent slopes
DcD2	Decatur silt loam, 12 to 20 percent slopes, eroded
DdC3	Decatur silty clay loam, 5 to 12 percent slopes, severely eroded
DdD3	Decatur silty clay loam, 12 to 20 percent slopes, severely eroded
DeB	Dewey silt loam, 2 to 5 percent slopes
DeC	Dewey silt loam, 5 to 12 percent slopes
DeD2	Dewey silt loam, 12 to 20 percent slopes, eroded
DgC3	Dewey silty clay loam, 5 to 12 percent slopes, severely eroded
DgD3	Dewey silty clay loam, 12 to 20 percent slopes, severely eroded
DhD	Ditney loam, 12 to 25 percent slopes
DhF	Ditney loam, 25 to 60 percent slopes
DmB	Dunmore silt loam, 2 to 5 percent slopes
DmC	Dunmore silt loam, 5 to 12 percent slopes
DmD2	Dunmore silt loam, 12 to 20 percent slopes, eroded
DmE2	Dunmore silt loam, 20 to 35 percent slopes, eroded
DnC3	Dunmore silty clay loam, 5 to 12 percent slopes, severely eroded
DnD3	Dunmore silty clay loam, 12 to 20 percent slopes, severely eroded
Du	Dunning silty clay loam
Em	Emory silt loam
EtB	Etowah silt loam, 2 to 5 percent slopes
EtC	Etowah silt loam, 5 to 12 percent slopes
EtD	Etowah silt loam, 12 to 20 percent slopes
FaC2	Farragut silt loam, 5 to 12 percent slopes, eroded
FgD3	Farragut silty clay, 12 to 20 percent slopes, severely eroded
FhC	Fletcher silt loam, 5 to 12 percent slopes
FhD	Fletcher silt loam, 12 to 20 percent slopes
FtC	Fullerton cherty silt loam, 5 to 12 percent slopes
FtD	Fullerton cherty silt loam, 12 to 20 percent slopes
FtE	Fullerton cherty silt loam, 20 to 40 percent slopes
GdD	Gladeville-Rock outcrop complex, 5 to 25 percent slopes
Gr	Greendale silt loam
Ha	Hamblen silt loam
HeC	Hartsells fine sandy loam, 5 to 15 percent slopes
HoC	Holston loam, 3 to 12 percent slopes

SYMBOL	NAME
JeC	Jefferson fine sandy loam, 3 to 12 percent slopes
JeD	Jefferson fine sandy loam, 12 to 25 percent slopes
JeE	Jefferson fine sandy loam, 25 to 50 percent slopes
JfD	Jefferson cobbly fine sandy loam, 12 to 25 percent slopes
JfE	Jefferson cobbly fine sandy loam, 25 to 50 percent slopes
JyD	Jeffrey cobbly loam, 12 to 25 percent slopes
JyF	Jeffrey cobbly loam, 25 to 60 percent slopes
LeB	Leadvale silt loam, 2 to 5 percent slopes
LkC	Linker loam, 5 to 12 percent slopes
LtC	Litz shaly silt loam, 5 to 12 percent slopes
LtD	Litz shaly silt loam, 12 to 20 percent slopes
LtD3	Litz shaly silt loam, 12 to 20 percent slopes, severely eroded
LtE	Litz shaly silt loam, 20 to 35 percent slopes
LY	Litz and Sequoia soils, gullied
Lz	Lobdell silt loam
MnB	Minvale silt loam, 2 to 5 percent slopes
MnC	Minvale silt loam, 5 to 12 percent slopes
MtE	Montevallo shaly silt loam, 12 to 30 percent slopes
Ne	Neubert loam
Nk	Newark silt loam
Ph	Philo silt loam
Po	Pope loam
Pu	Purdy silt loam
RaF	Ramsey-Rock outcrop complex, 20 to 70 percent slopes
RgD	Ranger channery silt loam, 12 to 25 percent slopes
RgF	Ranger channery silt loam, 25 to 60 percent slopes
Sa	Sequatchie loam
SeB	Sequoia silt loam, 2 to 5 percent slopes
SeC2	Sequoia silt loam, 5 to 12 percent slopes, eroded
SeD2	Sequoia silt loam, 12 to 20 percent slopes, eroded
SgC3	Sequoia silty clay, 5 to 12 percent slopes, severely eroded
SgD3	Sequoia silty clay, 12 to 20 percent slopes, severely eroded
ShC	Shelocta silt loam, 3 to 12 percent slopes
ShD	Shelocta silt loam, 12 to 25 percent slopes
SnD	Shouns silt loam, 12 to 25 percent slopes
SpF	Spivey cobbly loam, 20 to 60 percent slopes
Ss	Staser loam
St	Statler loam
SvF	Steekee loam, 20 to 50 percent slopes
SyF	Sylco channery silt loam, 25 to 65 percent slopes
TaC2	Talbott silt loam, 5 to 12 percent slopes, eroded
TaD2	Talbott silt loam, 12 to 20 percent slopes, eroded
TbC3	Talbott clay, 5 to 12 percent slopes, severely eroded
TbD3	Talbott clay, 12 to 20 percent slopes, severely eroded
TcD	Talbott-Rock outcrop complex, 5 to 20 percent slopes
TcE	Talbott-Rock outcrop complex, 20 to 40 percent slopes
TeD	Tellico loam, 12 to 20 percent slopes
TeE	Tellico loam, 20 to 35 percent slopes
TeF	Tellico loam, 35 to 60 percent slopes
ToD3	Tellico clay loam, 12 to 20 percent slopes, severely eroded
ToE3	Tellico clay loam, 20 to 35 percent slopes, severely eroded
TS	Tellico and Dewey soils, gullied
Ty	Transylvania loam
UcF	Unicoi cobbly loam, 30 to 65 percent slopes
WaF	Wallen gravelly fine sandy loam, 20 to 60 percent slopes
WbB	Waynesboro loam, 2 to 5 percent slopes
WbC	Waynesboro loam, 5 to 12 percent slopes
WbD	Waynesboro loam, 12 to 20 percent slopes
WbE	Waynesboro loam, 20 to 35 percent slopes
WnC3	Waynesboro clay loam, 5 to 12 percent slopes, severely eroded
WnD3	Waynesboro clay loam, 12 to 20 percent slopes, severely eroded
Wt	Whitwell loam

MONROE COUNTY, TENNESSEE — SHEET NUMBER 1

①

N


2 450 000 FEET
(Joins inset A, sheet 2)
465 000 FEET
LOUDON COUNTY
LOUDON COUNTY BDY
LOUDON COUNTY
WATSON RIDGE
Old Sweetwater
Sweetwater Creek
SOUTHERN
Fairlane
Pond Creek
Branch
Creek
75
11
(Joins inset, sheet 14)
(Joins sheet 2)
455 000 FEET
(Joins sheet 3)
2 480 000 FEET
DeC
TaC2
SeD2 Ha
DdC3
DgC3
DeC MnC
FtD FtC
MnC

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

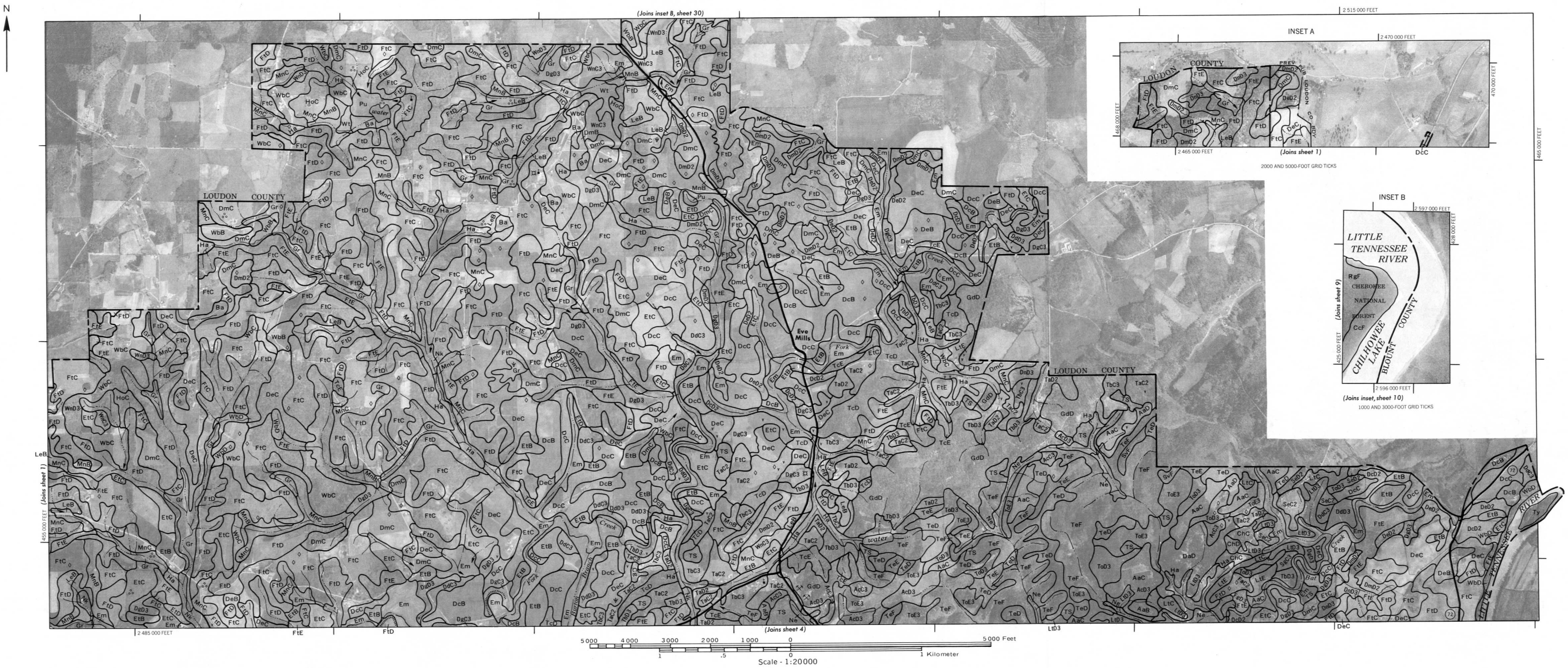
1 .5 0 1 Kilometer

Scale - 1:20000

MONROE COUNTY, TENNESSEE NO. 1

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

MONROE COUNTY, TENNESSEE — SHEET NUMBER 2

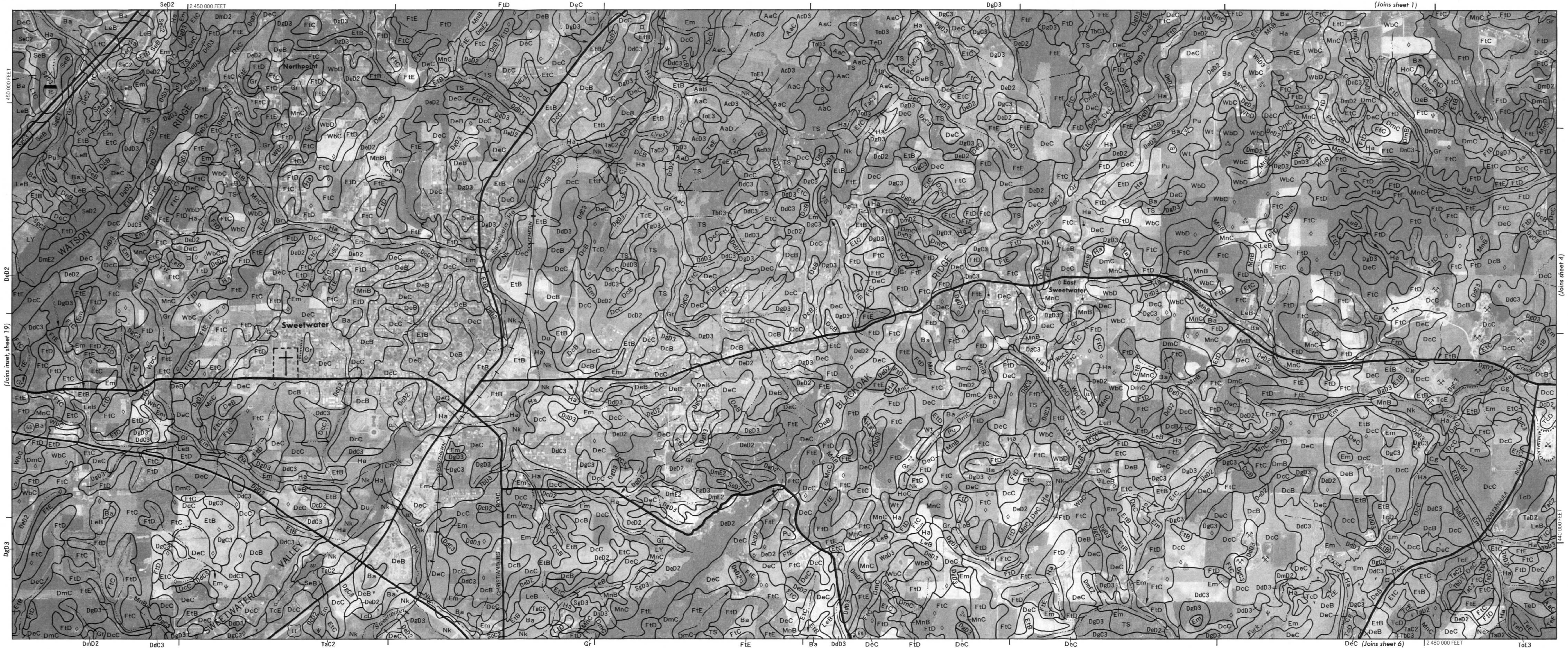

N
(Joins inset B, sheet 30)
LOUDON COUNTY
LOUDON COUNTY
LOUDON COUNTY
Eve Mills
Fork
Creek
Creek
Creek
water
water
Burnt Branch
Fork
Bat Creek
LITTLE TENNESSEE RIVER
(Joins sheet 1)
(Joins sheet 4)
2 485 000 FEET
2 515 000 FEET
455 000 FEET
465 000 FEET
FtE
FtD
LtD3
DeC
LeB
INSET A
2 470 000 FEET
LOUDON COUNTY
PREV SUR BDY
LOUDON CO BDY
468 000 FEET
470 000 FEET
2 465 000 FEET
(Joins sheet 1)
DcC
2000 AND 5000-FOOT GRID TICKS
INSET B
2 597 000 FEET
LITTLE TENNESSEE RIVER
428 000 FEET
RgF
CHEROKEE NATIONAL FOREST
CcF
(Joins sheet 9)
425 000 FEET
CHILHOWEE LAKE
BLOUNT COUNTY
2 596 000 FEET
(Joins inset, sheet 10)
1000 AND 3000-FOOT GRID TICKS
5000
4000
3000
2000
1000
0
5000 Feet
1
.5
0
1 Kilometer

Scale - 1:20000

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

MONROE COUNTY, TENNESSEE — SHEET NUMBER 3

N


(Joins sheet 1)
(Joins sheet 4)
(Joins sheet 6)
(Joins inset, sheet 19)
2 450 000 FEET
2 480 000 FEET
450 000 FEET
440 000 FEET
Northpoint
Sweetwater
East Sweetwater
WATSON RIDGE
SWEETWATER VALLEY
BLACKOAK RIDGE
Sweetwater Creek
CHRISTIANBURG ROAD
OOSTANAULA ROAD
Fork Creek
SOUTHERN

5000 4000 3000 2000 1000 0 5000 Feet

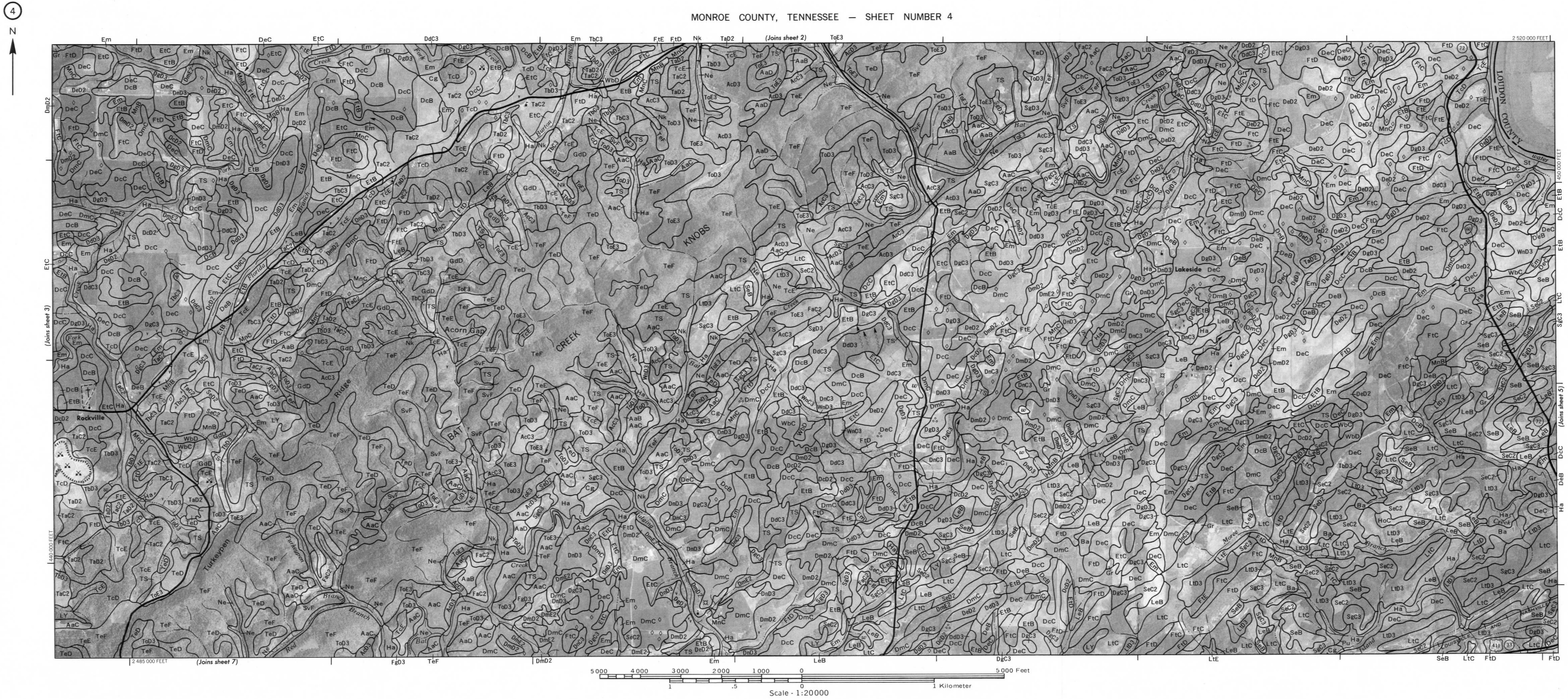
1 .5 0 1 Kilometer

Scale - 1:20000

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

④

MONROE COUNTY, TENNESSEE — SHEET NUMBER 4



N
(Joins sheet 2)
(Joins sheet 3)
(Joins sheet 5)
(Joins sheet 7)
2 520 000 FEET
2 485 000 FEET
440 000 FEET
450 000 FEET
LOUDON COUNTY
Rockville
Lakeside
KNOBS
CREEK
Acorn Gap
Ridge
BAT
Turkeypen
Florida
Fork
Creek
Branch
Bat
Burton
Red
Morse
Pond
Island
5000
4000
3000
2000
1000
0
5000 Feet
1
.5
0
1 Kilometer
Scale - 1:20000

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

MONROE COUNTY, TENNESSEE NO. 4

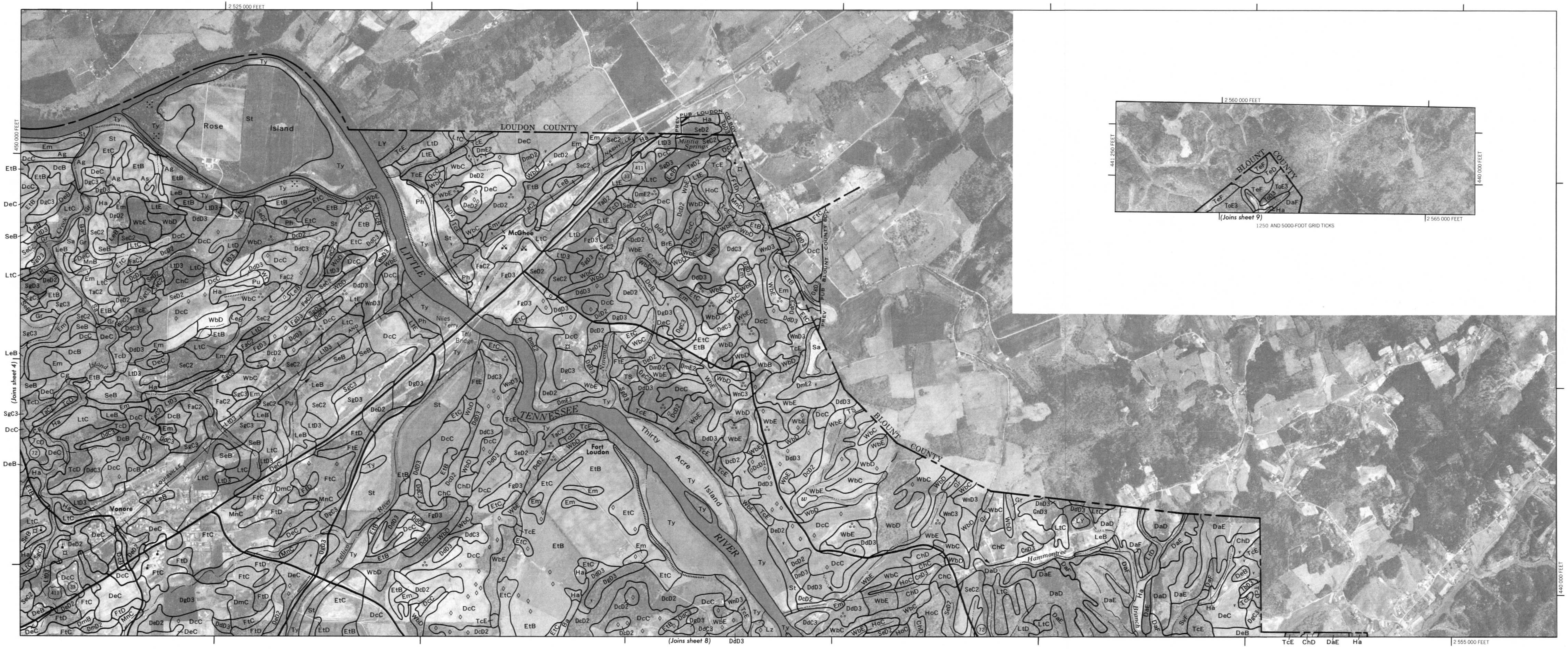
MONROE COUNTY, TENNESSEE — SHEET NUMBER 5

⑤

N

MONROE COUNTY, TENNESSEE NO. 5

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.


2 525 000 FEET
450 000 FEET
Rose Island
LOUDON COUNTY
Mitilia Springs
McGhee
LITTLE TENNESSEE RIVER
Niles Ferry
Toll Bridge
Fort Loudon
Thirty Acre Island
Vonore
Island Creek
Tellico River
BLOUNT COUNTY
Hammontree Branch
(Joins sheet 4)
(Joins sheet 8)
DdD3
TcE ChD DaE Ha
2 555 000 FEET
440 000 FEET
2 560 000 FEET
441 250 FEET
2 565 000 FEET
(Joins sheet 9)
1250 AND 5000-FOOT GRID TICKS
EtB
DeC
SeB
LtC
LeB
SgC3
DcC
DeB

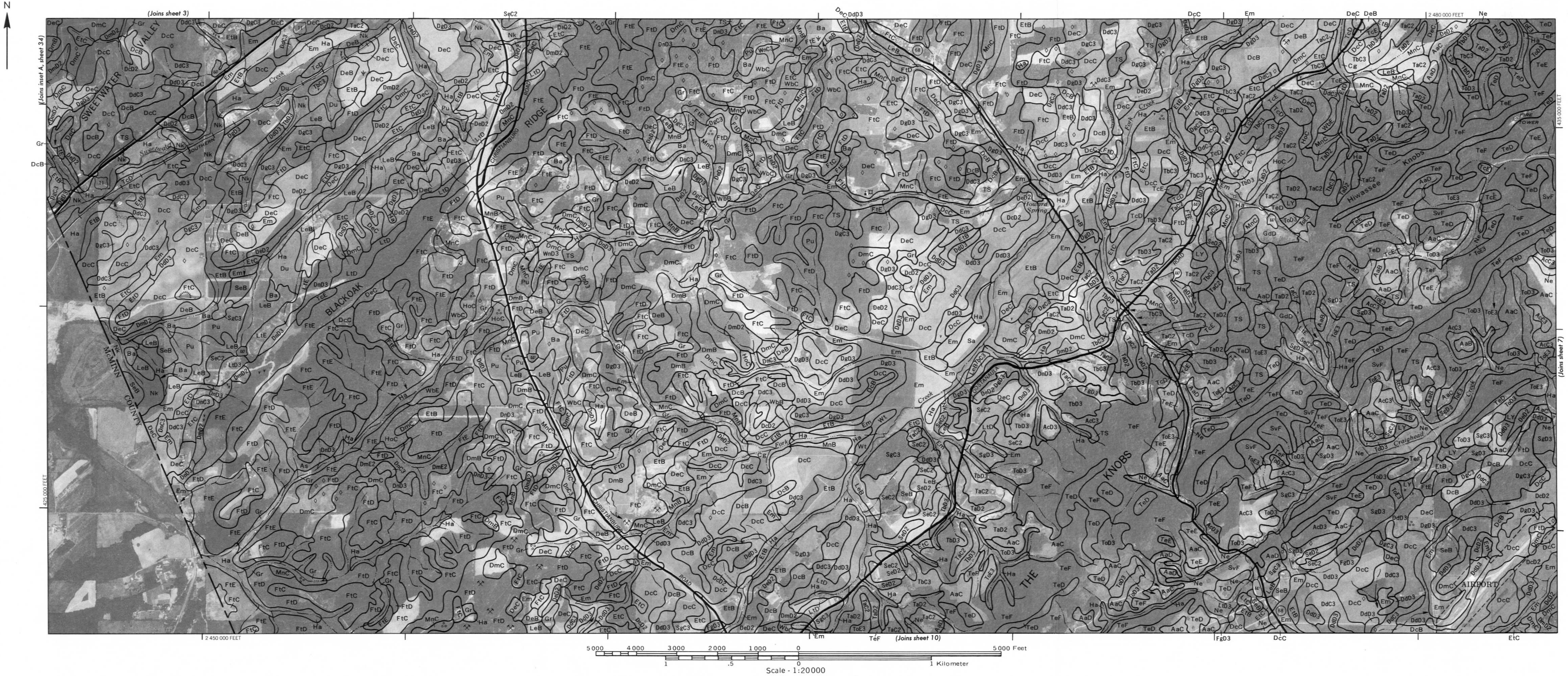
5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

1 .5 0 1 Kilometer

Scale - 1:20000

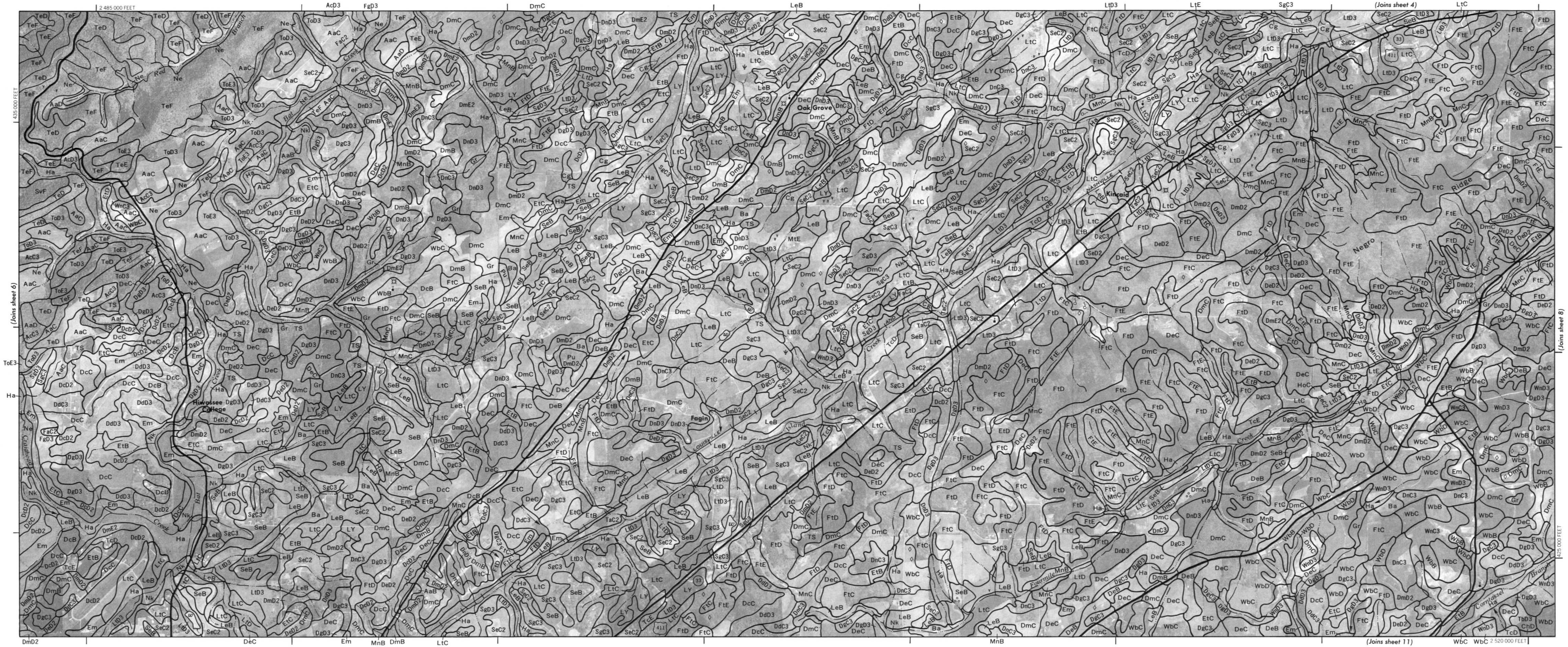
⑥

MONROE COUNTY, TENNESSEE — SHEET NUMBER 6


N
(Joins sheet 3)
(Joins inset A, sheet 34)
(Joins sheet 7)
(Joins sheet 10)
2 480 000 FEET
435 000 FEET
425 000 FEET
2 450 000 FEET
SWEETWATER
VALLEY
Sweetwater
Creek
SOUTHERN
BLACKOAK
CHRISTIANBURG
RIDGE
ROAD
McMINN
COUNTY
Howard Spring
Fork
THE
KNOBS
Hiwassee
Knobs
FIRE TOWER
Craighead
AIRPORT
5 000 4 000 3 000 2 000 1 000 0 5 000 Feet
1 .5 0 1 Kilometer
Scale - 1:20000

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

MONROE COUNTY, TENNESSEE NO. 6

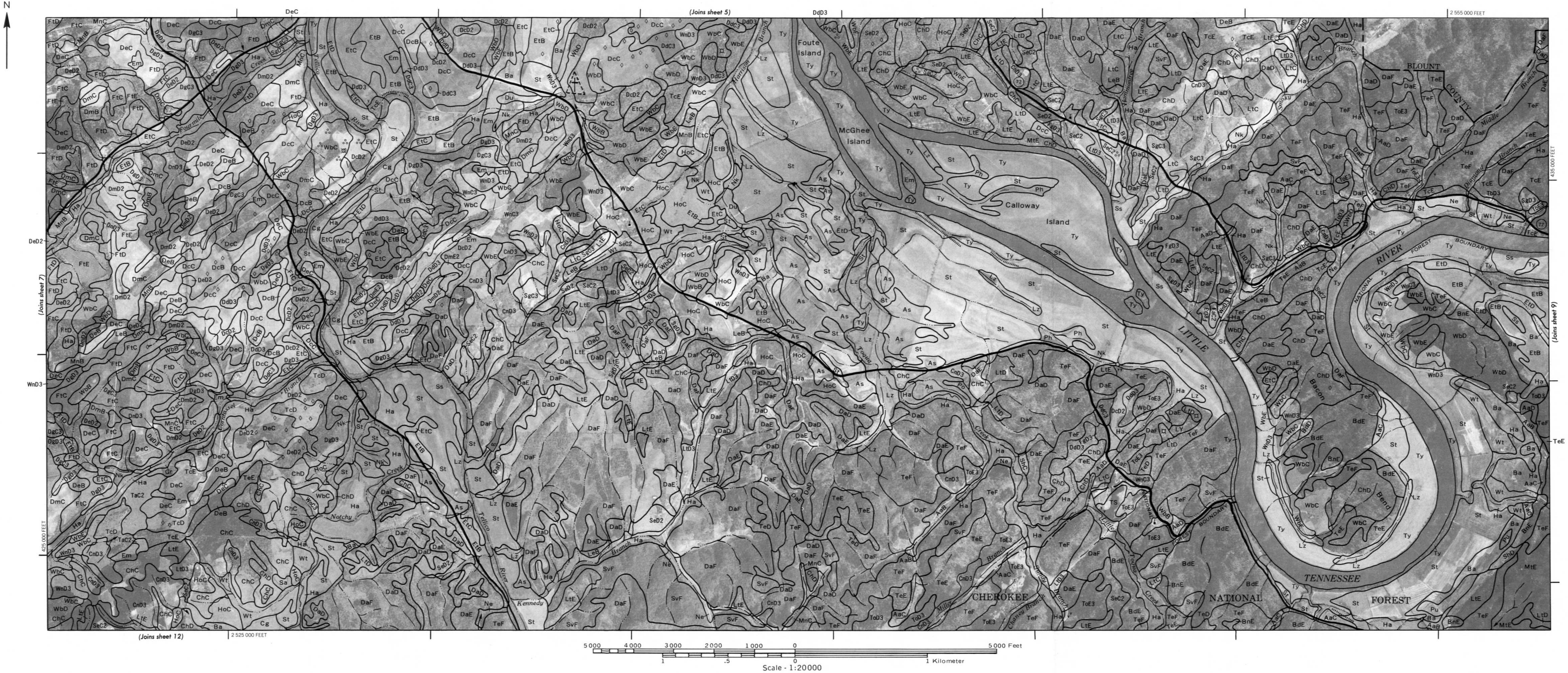

N
2 485 000 FEET
435 000 FEET
425 000 FEET
2 520 000 FEET
(Joins sheet 4)
(Joins sheet 6)
(Joins sheet 8)
(Joins sheet 11)
Oak Grove
Kincaid
Hiwassee College
Fagin
Negro
Ridge
Red
Bat
Creek
Branch
Nashville
Louisville
Fourmile
Corntassel
Island

Scale - 1:20000

5000 4000 3000 2000 1000 0 5000 Feet
1 .5 0 1 Kilometer

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

MONROE COUNTY, TENNESSEE — SHEET NUMBER 8


N
(Joins sheet 5)
(Joins sheet 7)
(Joins sheet 9)
(Joins sheet 12)
DeC
DdD3
DeD2
WnD3
TeE
2 555 000 FEET
2 525 000 FEET
435 000 FEET
425 000 FEET
BLOUNT
COUNTY
Foute Island
McGhee Island
Calloway Island
LITTLE
TENNESSEE
RIVER
Bacon Bend
CHEROKEE
NATIONAL
FOREST
NATIONAL FOREST BOUNDARY
Tellico River
Notchy Creek
Kennedy
Fourmile Branch
Harrison Branch
Citico Creek
Baker Creek
5000
4000
3000
2000
1000
0
5000 Feet
1
.5
0
1 Kilometer
Scale - 1:20000

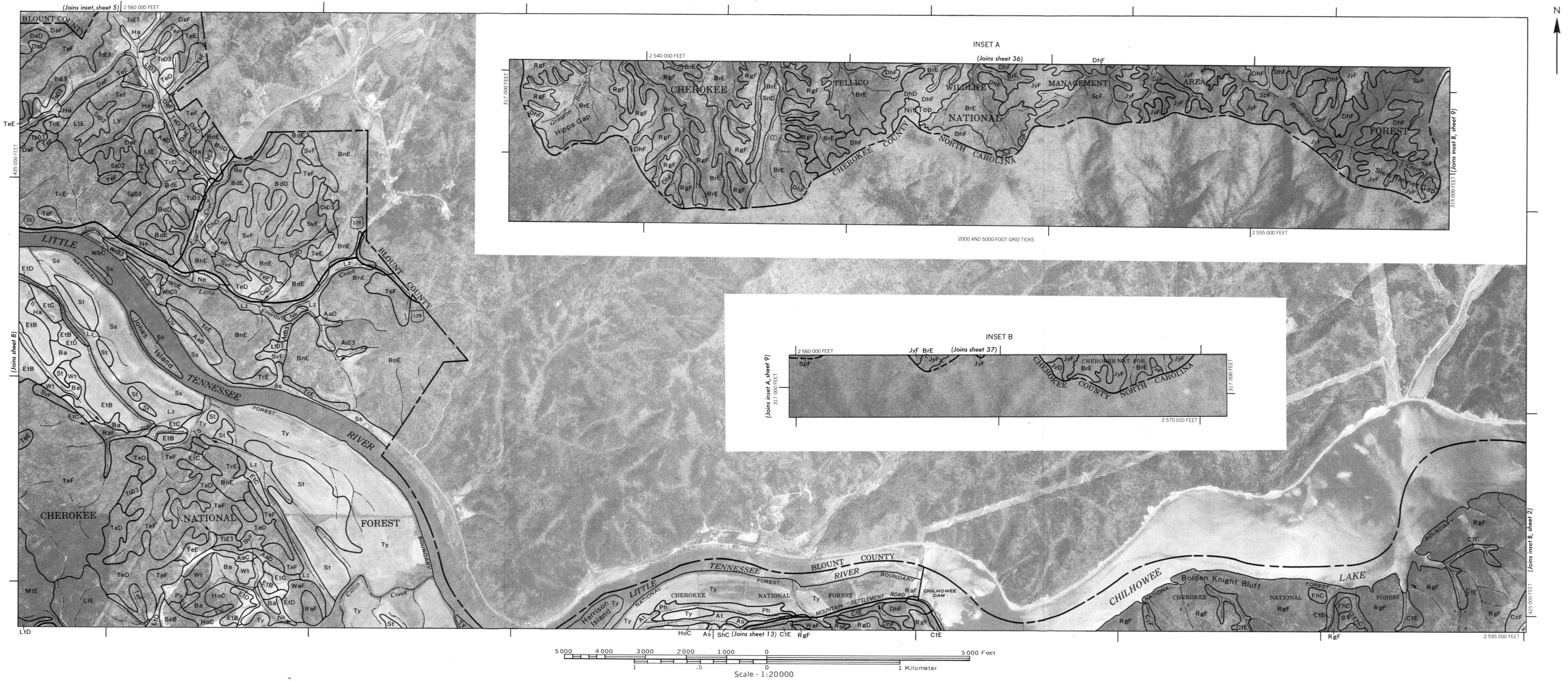
This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

MONROE COUNTY, TENNESSEE NO. 8

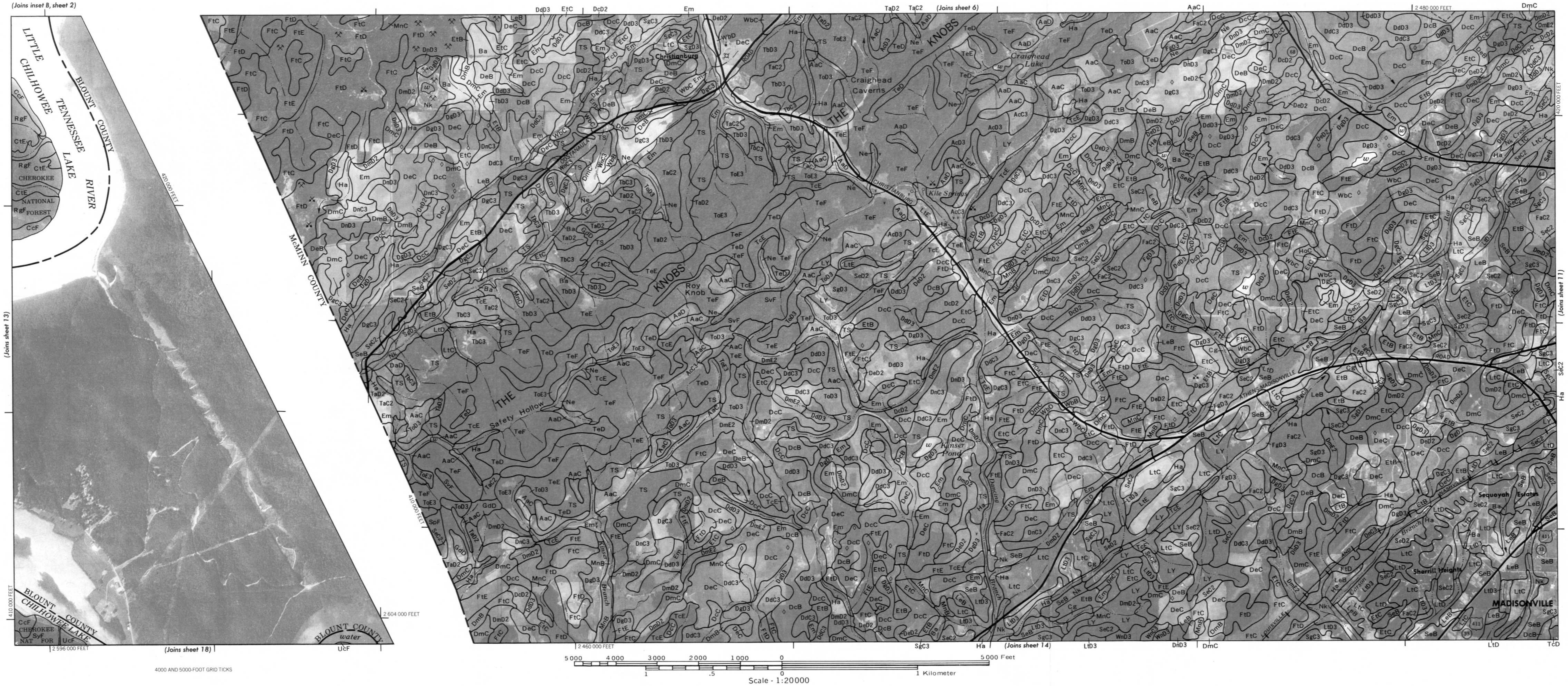
MONROE COUNTY, TENNESSEE — SHEET NUMBER 9

MONROE COUNTY, TENNESSEE NO. 9

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.


N
(Joins inset, sheet 5)
2 560 000 FEET
BLOUNT COUNTY
(Joins sheet 8)
435 000 FEET
LITTLE TENNESSEE RIVER
Jones Island
CHEROKEE NATIONAL FOREST
BOUNDARY
BLOUNT COUNTY
Fourmile Creek
Citico Creek
Harrison Island
Little Tennessee River
Blount County Boundary
Mountain Settlement Road
CHILHOWEE DAM
Chilhowee Lake
Bolden Knight Bluff
(Joins sheet 13)
(Joins inset B, sheet 2)
425 000 FEET
2 595 000 FEET
INSET A
2 540 000 FEET
(Joins sheet 36)
317 000 FEET
CHEROKEE TELLICO WILDLIFE MANAGEMENT AREA
NATIONAL FOREST
Hipps Gap
Grayton Branch
Nit Top
CHEROKEE COUNTY NORTH CAROLINA
Slea Runner Gap
(Joins inset B, sheet 9)
315 000 FEET
2000 AND 5000-FOOT GRID TICKS
2 555 000 FEET
INSET B
2 560 000 FEET
(Joins sheet 37)
(Joins inset A, sheet 9)
CHEROKEE NAT. FOR.
CHEROKEE COUNTY NORTH CAROLINA
2 570 000 FEET
TeE
DaF
DaD
ToE3
Ha
TeF
ToD3
TeD
LtE
SeD2
LY
AaD
TcD
BdE
BdD
BnE
SvF
Ne
CnD3
ChD
WnB
WbC
WnC3
Lz
Ss
St
EtD
EtC
EtB
Ba
Wt
SvF
RaF
TcE
AcC3
LtD3
Ty
MtE
SeB
HoC
Pu
AaC
WaF
Nk
At
As
Ph
ShC
CtE
RgF
RgD
DhF
FhC
CcF
BrE
SnD
JyF
JyD
SpF
DhD
5 000 Feet
4 000
3 000
2 000
1 000
0
1 Kilometer
Scale - 1:20000

MONROE COUNTY, TENNESSEE — SHEET NUMBER 10

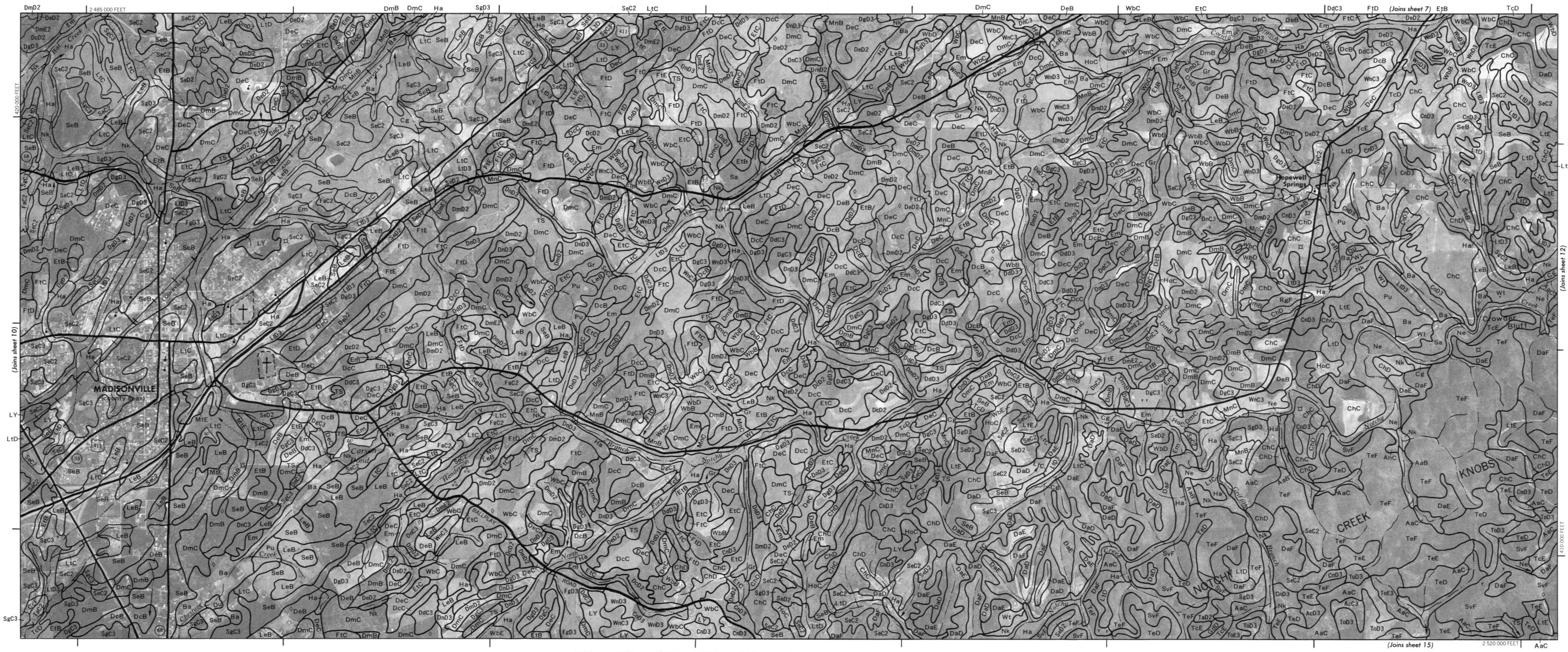

N
(Joins inset B, sheet 2)
(Joins sheet 6)
(Joins sheet 11)
(Joins sheet 13)
(Joins sheet 14)
(Joins sheet 18)
LITTLE CHILHOWEE TENNESSEE LAKE
BLOUNT COUNTY
TENNESSEE RIVER
CHEROKEE NATIONAL FOREST
McMINN COUNTY
BLOUNT COUNTY CHILHOWEE LAKE
CHEROKEE NAT FOR
water
Christianburg
THE KNOBS
Craighead Caverns
Craighead Lake
Kile Springs
Roy Knob
Safety Hollow
Kinser Pond
Sequoyah Estates
Sherrill Heights
MADISONVILLE
ATHENS-MADISONVILLE ROAD
CHRISTIANBURG ROAD
420 000 FEET
410 000 FEET
2 480 000 FEET
2 460 000 FEET
2 596 000 FEET
2 604 000 FEET
5000
4000
3000
2000
1000
0
5000 Feet
1
.5
0
1 Kilometer

Scale - 1:20000

4000 AND 5000-FOOT GRID TICKS

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

MONROE COUNTY, TENNESSEE — SHEET NUMBER 11


N
2 485 000 FEET
400 000 FEET
410 000 FEET
2 520 000 FEET
(Joins sheet 7)
(Joins sheet 10)
(Joins sheet 12)
(Joins sheet 15)
MADISONVILLE
(County Seat)
Hopewell Springs
Crowder Bluff
NOTCHY CREEK KNOBS
Carson Pond
Notchy Creek
Fork Creek
Handcock Branch
Griffith Branch
Pine Creek
Corntassel Branch
Chestua Creek
BALLPLAY ROAD
NASHVILLE
LOUISVILLE
Ha
SeB
DmC

5000 4000 3000 2000 1000 0 5000 Feet

1 .5 0 1 Kilometer

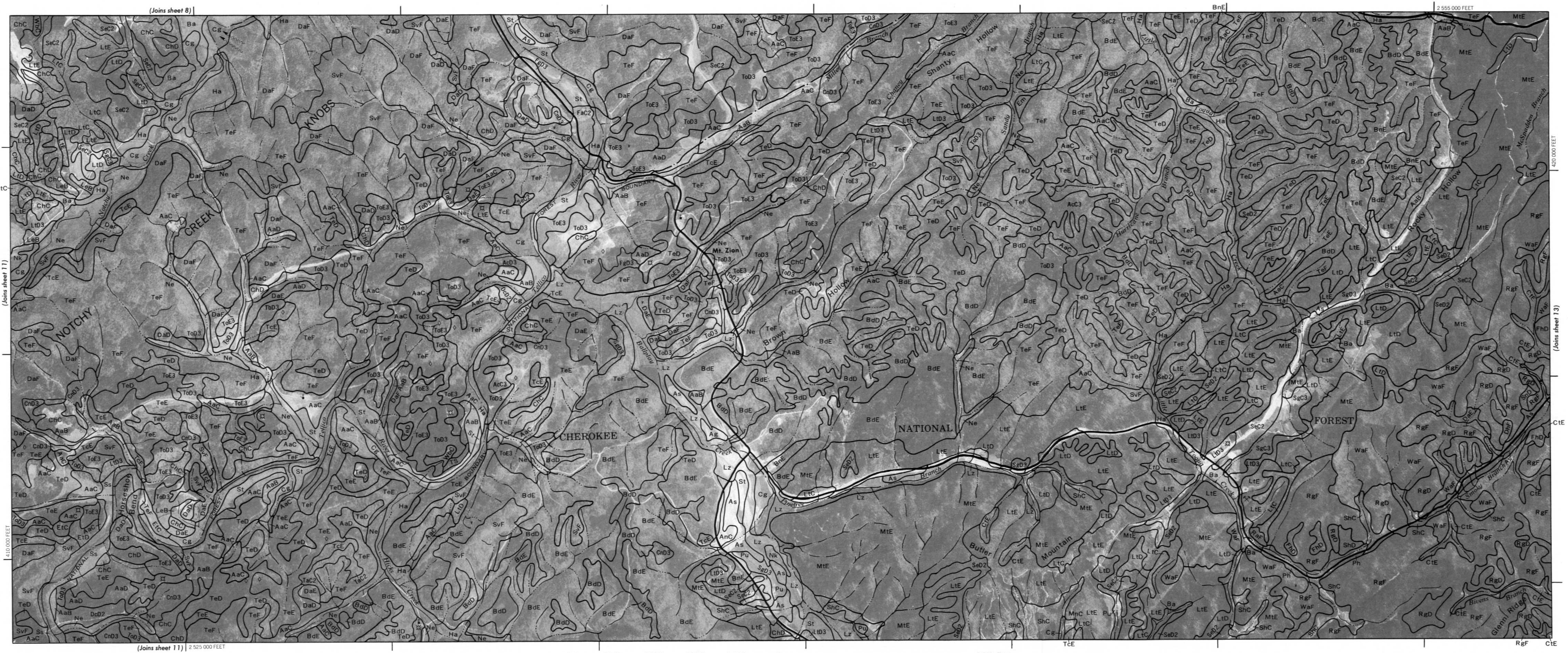
Scale - 1:20000

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

⑫

N

MONROE COUNTY, TENNESSEE — SHEET NUMBER 12


(Joins sheet 8)
(Joins sheet 11)
(Joins sheet 11)
(Joins sheet 13)
2 555 000 FEET
2 525 000 FEET
420 000 FEET
410 000 FEET
NOTCHY
CREEK
KNOBS
CHEROKEE
NATIONAL
FOREST
Mt. Zion
Brown
Hollow
Shanty
Chunky
Miller
Branch
Sandy
Hurricane
Rocky
Hollow
Laurel
Tellico
River
Horseshoe
Bend
Hicks
Creek
Butler
Mountain
Glenn Ridge
McSpadden Branch
Bivens
Branch
BOUNDARY
FOREST
NATIONAL

5000 4000 3000 2000 1000 0 5000 Feet

1 .5 0 1 Kilometer

Scale - 1:20000

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

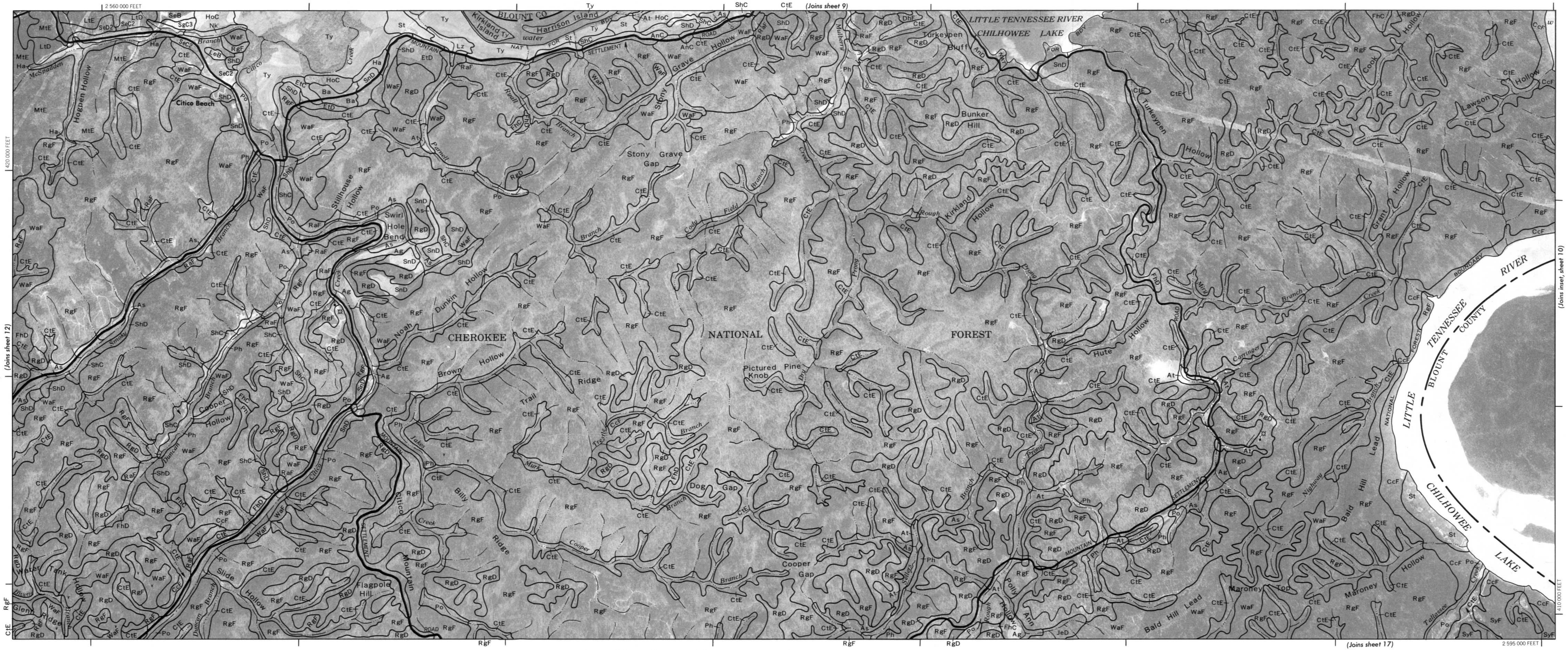
MONROE COUNTY, TENNESSEE NO. 12

MONROE COUNTY, TENNESSEE — SHEET NUMBER 13

13

N

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.


2 560 000 FEET
(Joins sheet 9)
(Joins sheet 12)
(Joins inset, sheet 10)
(Joins sheet 17)
420 000 FEET
410 000 FEET
2 595 000 FEET
BLOUNT CO
Kirkland Island
Harrison Island
water
NAT FOR
SETTLEMENT ROAD
MOUNTAIN
LITTLE TENNESSEE RIVER
CHILHOWEE LAKE
Turkeypen Bluff
Mulberry
McSpadden
Hogpen Hollow
Citico Beach
Citico Creek
Stony Grave Hollow
Stony Grave Gap
Rough Branch
Parnell Branch
Bunker Hill
Turkeypen Hollow
Lawson Hollow
Cook Hollow
Grant Hollow
Stillhouse Hollow
Swirl Hole Bend
Cody Field Branch
Rough Prong
Kirkland Hollow
Prong
Mill Branch
Creek
Noah Dunkin Hollow
Brown Hollow
CHEROKEE NATIONAL FOREST
Trail Ridge
Pictured Knob
Pine Drive
Hute Hollow
Carringer Branch
ROAD
BOUNDARY
LITTLE TENNESSEE RIVER
BLOUNT COUNTY
CHILHOWEE LAKE
FOREST
NATIONAL
Smith Branch
Cooper Hollow
Duncan Branch
Trestle Branch
Murr Branch
Dog Gap
Branch
Billy Ridge
Cooper Branch
Cooper Gap
Nighthawk Branch
Bald Hill Lead
Maroney Top
Maroney Hollow
Tallassee Creek
Polly Ann
Rough Branch
Flagpole Hill
Citico Mountain
Slide Hollow
Water Tank Hollow
Glen Ridge
Jakes Branch
Sheep Branch
Mountain
SETTLEMENT
Ag
AnC
As
At
Ba
CcF
CtE
DhF
EtC
EtD
FhC
FhD
Ha
HoC
JeD
LeB
Lz
LtD
LtE
MtE
Nk
Ph
Po
RaF
RgD
RgF
SeB
SeC2
SgC3
ShC
ShD
SnD
St
SyF
Ty
WaF
w

5000 4000 3000 2000 1000 0 5000 Feet

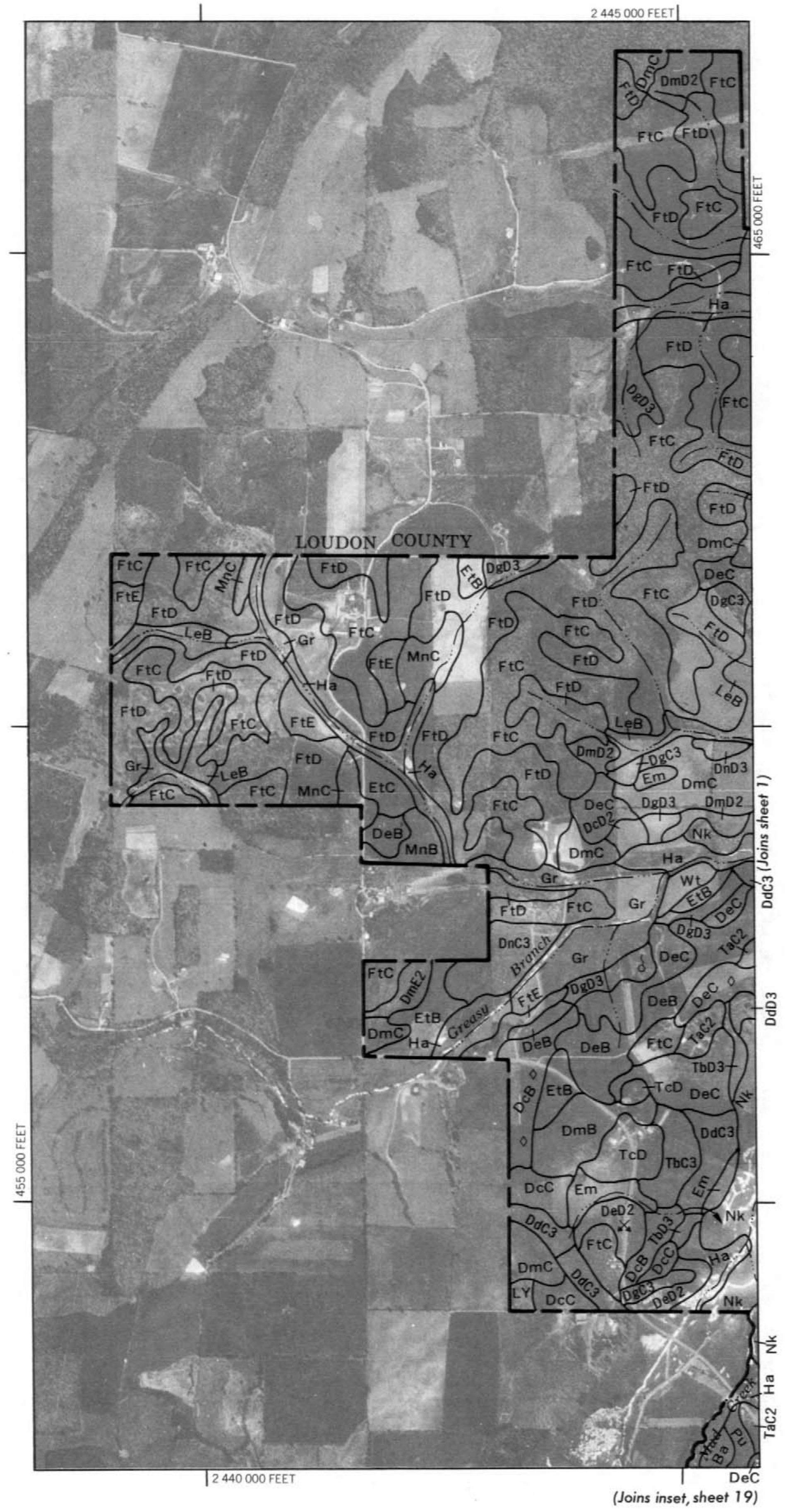
1 .5 0 1 Kilometer

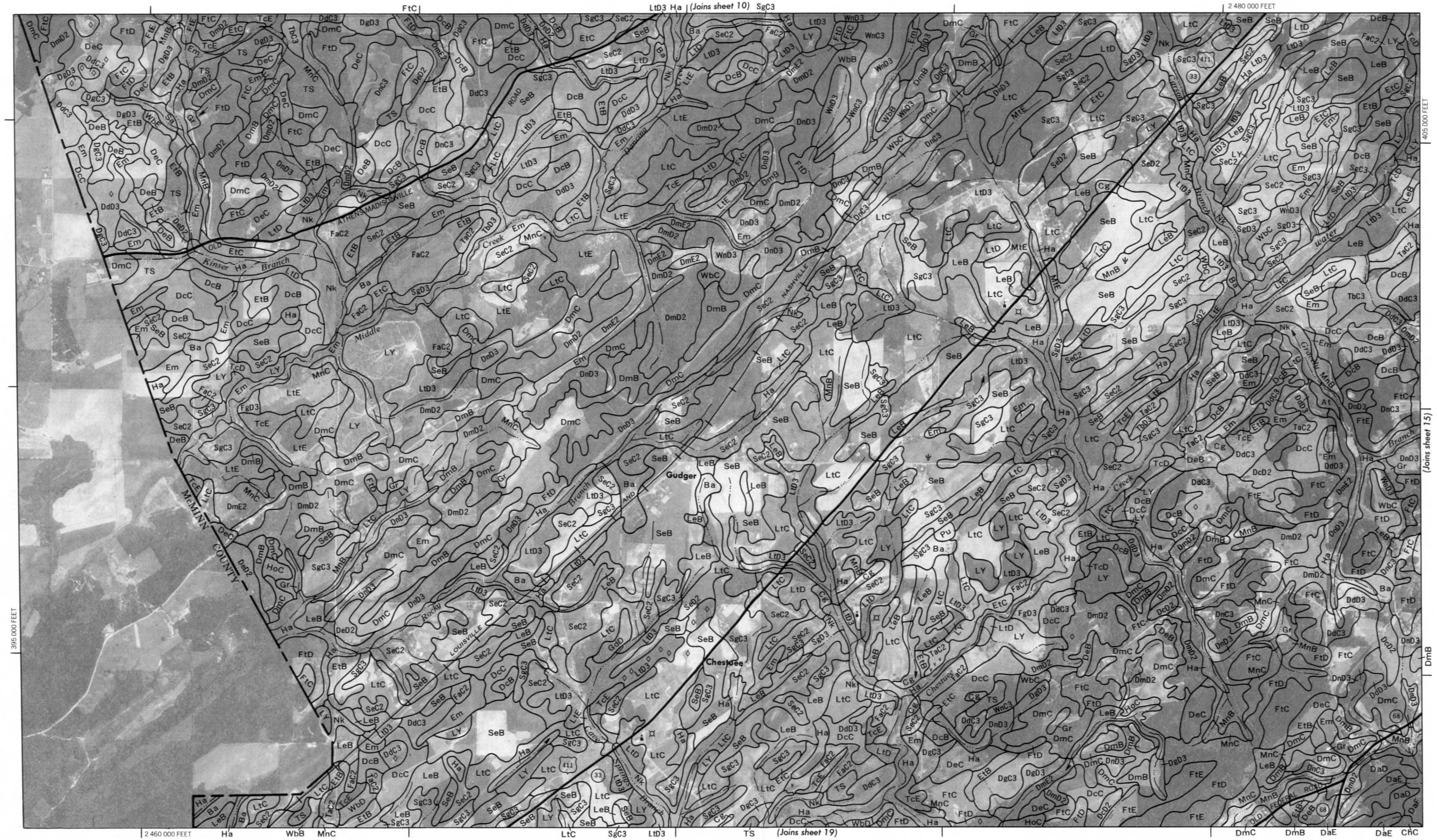
Scale - 1:20000

⑭

N

MONROE COUNTY, TENNESSEE — SHEET NUMBER 14


2 445 000 FEET
465 000 FEET
LOUDON COUNTY
Greasy Branch
DdC3 (Joins sheet 1)
DdD3
455 000 FEET
2 440 000 FEET
DeC
(Joins inset, sheet 19)


FtC
LtD3 Ha (Joins sheet 10) SgC3
2 480 000 FEET
405 000 FEET
ATHENS-MADISONVILLE ROAD
OLD
Kinser Ha Branch
Creek
Middle
NASHVILLE
Gudger
Chestuee
LOUISVILLE ROAD
McMINN COUNTY
Water
Branch
(Joins sheet 15)
395 000 FEET
2 460 000 FEET
Ha
WbB
MnC
LtC
SgC3
LtD3
TS
(Joins sheet 19)
DmC
DmB
DaE
DaE
ChC

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

1 .5 0 1 Kilometer

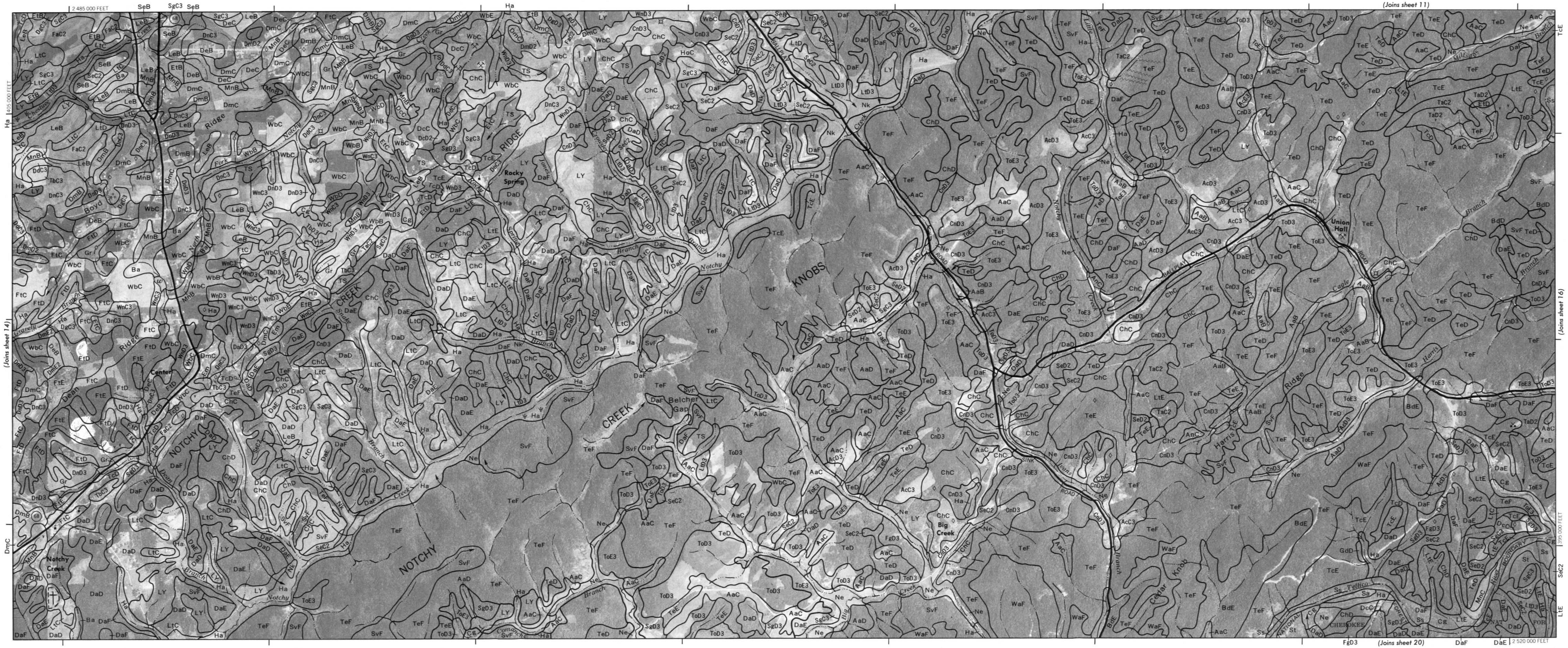
Scale - 1:20000

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

MONROE COUNTY, TENNESSEE NO. 14

MONROE COUNTY, TENNESSEE — SHEET NUMBER 15

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.


N
2 485 000 FEET
405 000 FEET
395 000 FEET
2 520 000 FEET
(Joins sheet 11)
(Joins sheet 14)
(Joins sheet 16)
(Joins sheet 20)
Boyd
Ridge
Rocky Spring
RIDGE
CREEK
Center
NOTCHY
KNOBS
Belcher Gap
Big Creek
Union Hall
Harris Ridge
Cedar Knob
Notchy Creek
CHEROKEE
Tellico
NOTCHY CREEK

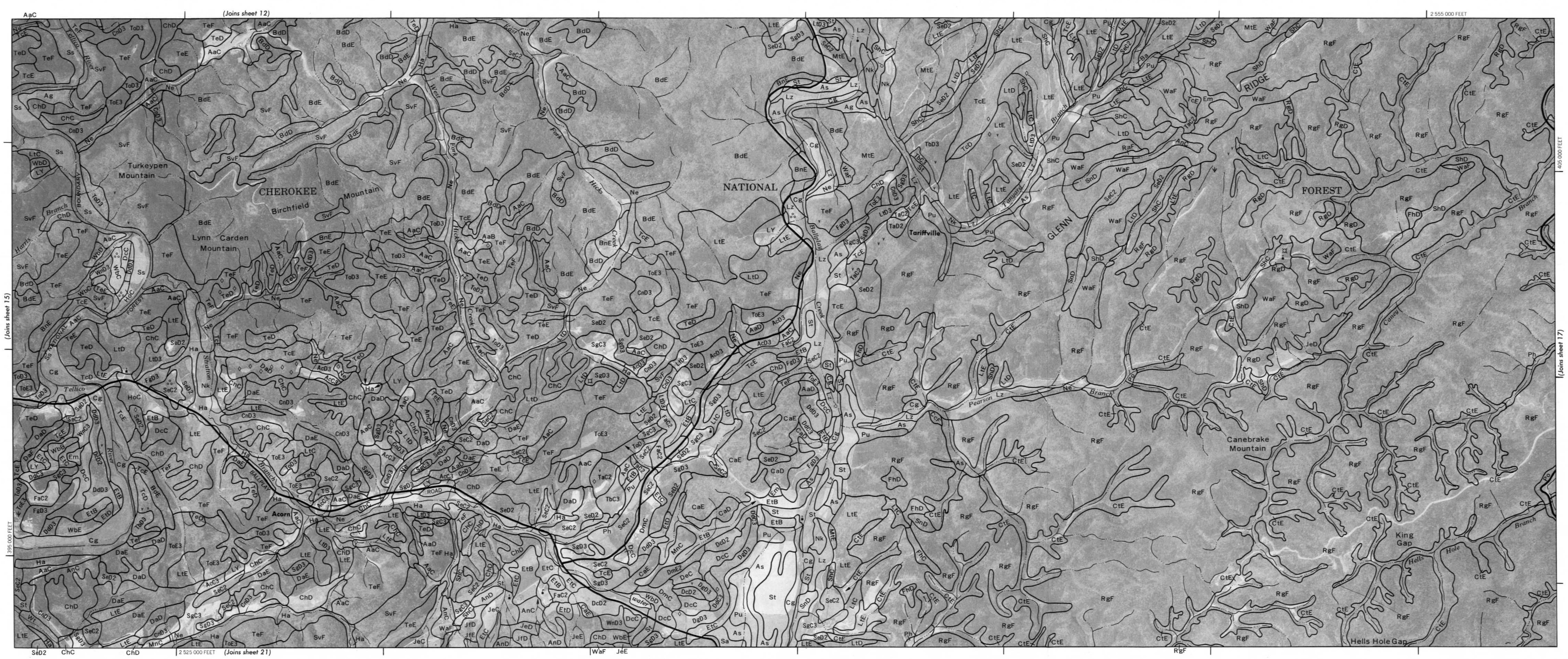
5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

1 .5 0 1 Kilometer

Scale - 1:20000

⑯

MONROE COUNTY, TENNESSEE — SHEET NUMBER 16


N
(Joins sheet 12)
(Joins sheet 15)
(Joins sheet 17)
(Joins sheet 21)
2 555 000 FEET
2 525 000 FEET
405 000 FEET
395 000 FEET
Turkeypen Mountain
CHEROKEE
Birchfield Mountain
Lynn Carden Mountain
NATIONAL
FOREST
GLENN RIDGE
Tariffville
Acorn
Canebrake Mountain
King Gap
Hells Hole Gap
Tellico River
Bald River
Pearson Branch
Hells Hole Branch
Caney Branch
Hicks Creek
North Fork
West Fork
Ballplay Creek
Harris Branch
Stratton Branch
Turkey Branch
Scarlett Mountain
FOREST ROAD
Nk Fork
Coldwater
BdE
BdD
SvF
TeF
TeE
TeD
LtE
LtD
RgF
RgD
CtE
WaF
ShC
ShD
SeD2
SeC2
SgD3
ChD
ChC
AaC
DaE
DaD
Ne
Ha
Cg
Lz
As
St
Pu
Nk
MtE
ToE3
ToD3
CnD3

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet
1 .5 0 1 Kilometer
Scale - 1:20000

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

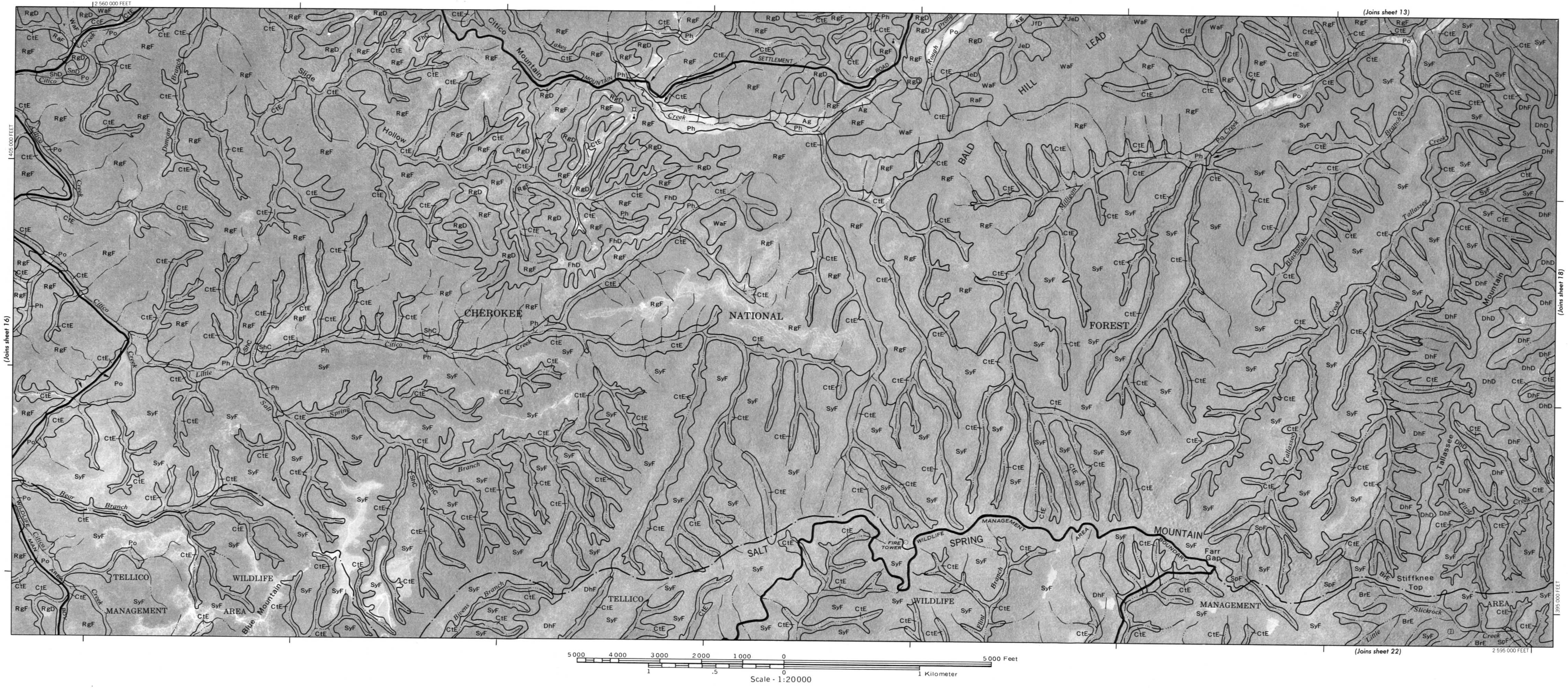
MONROE COUNTY, TENNESSEE NO. 16

MONROE COUNTY, TENNESSEE — SHEET NUMBER 17

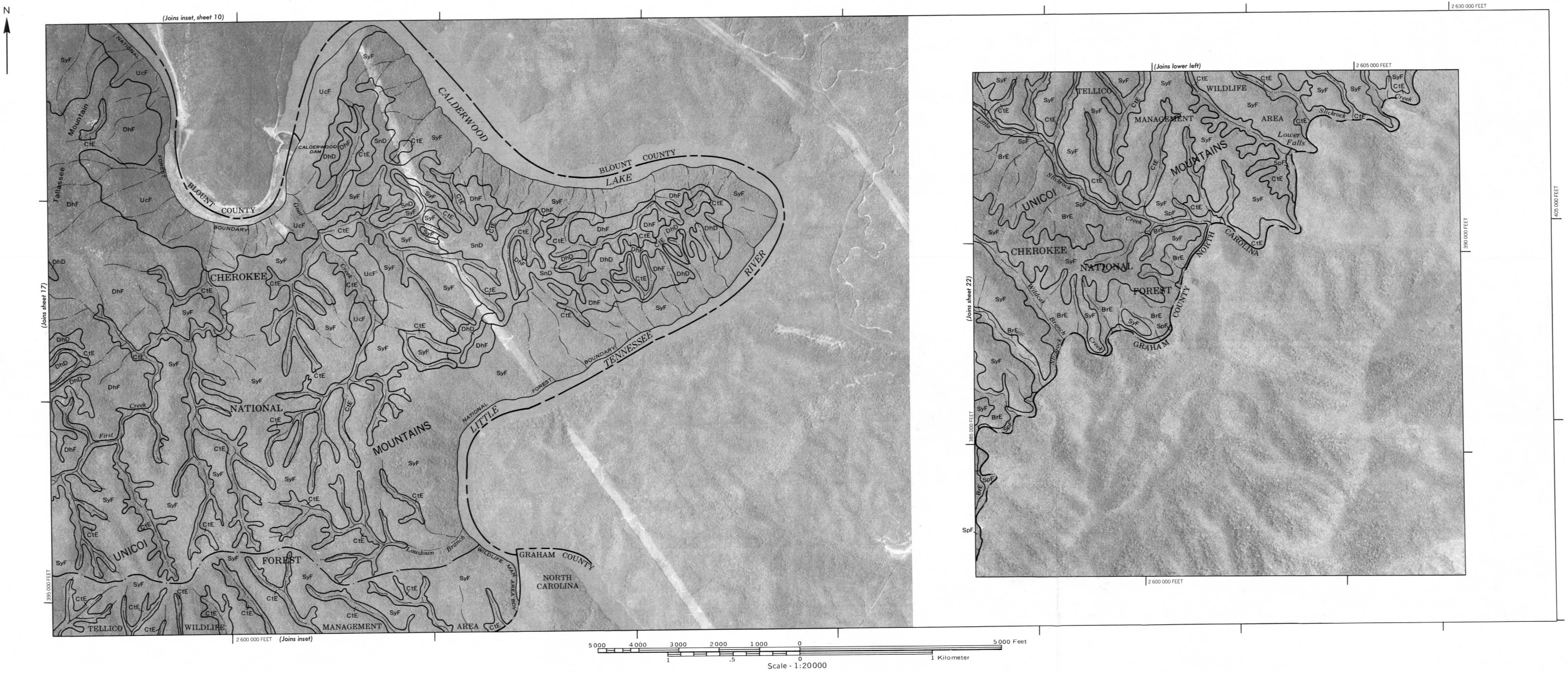
⑰

MONROE COUNTY, TENNESSEE NO. 17

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.


N
2 560 000 FEET
405 000 FEET
395 000 FEET
2 595 000 FEET
(Joins sheet 13)
(Joins sheet 16)
(Joins sheet 18)
(Joins sheet 22)
CHEROKEE
NATIONAL
FOREST
BALD
HILL
LEAD
Citico Mountain
SETTLEMENT
ROAD
Citico Creek
Little Citico Creek
Salt Spring Branch
Slide Hollow
Duncan Branch
Bear Branch
Rough Branch
Lakes
Pope Creek
Milligan
Tallassee Creek
Tallassee Mountain
Blackstone
Bivens Branch
Blue Mountain
Flint
Little Slickrock Creek
Stiffknee Top
Farr Gap
FIRE TOWER
TELLICO
WILDLIFE
MANAGEMENT
AREA
SALT
SPRING
MOUNTAIN
BOUNDARY
5 000
4 000
3 000
2 000
1 000
0
5 000 Feet
1
.5
0
1 Kilometer
Scale - 1:20000

MONROE COUNTY, TENNESSEE — SHEET NUMBER 18

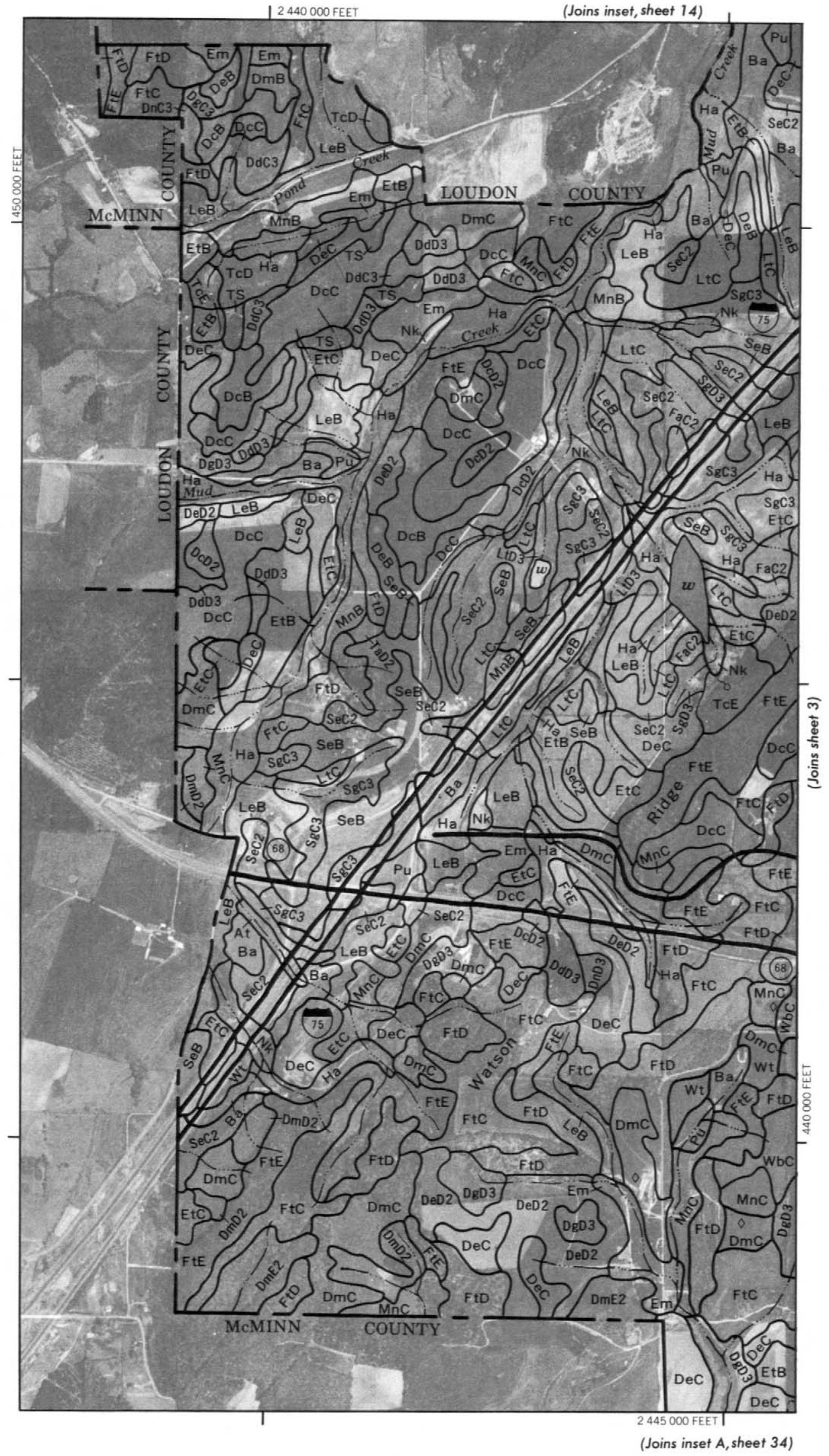

N
(Joins inset, sheet 10)
2 630 000 FEET
(Joins sheet 17)
(Joins inset)
2 600 000 FEET
395 000 FEET
(Joins lower left)
2 605 000 FEET
(Joins sheet 22)
390 000 FEET
385 000 FEET
405 000 FEET
2 600 000 FEET
CALDERWOOD
CALDERWOOD DAM
BLOUNT COUNTY
LAKE
BLOUNT COUNTY BOUNDARY
Goat
Tallassee
Mountain
NATIONAL
FOREST
CHEROKEE
NATIONAL
MOUNTAINS
UNICOI
FOREST
Creek
First Creek
Loudoun Branch
LITTLE TENNESSEE RIVER
NATIONAL FOREST BOUNDARY
WILDLIFE MAN AREA BDY
GRAHAM COUNTY
NORTH CAROLINA
TELLICO WILDLIFE MANAGEMENT AREA
Little
Slickrock Creek
Lower Falls
Wildcat Branch
Creek
NORTH CAROLINA
GRAHAM COUNTY
SyF
UcF
DhF
DhD
CtE
SnD
UcF
BrE
SpF
5000
4000
3000
2000
1000
0
5000 Feet
1
.5
0
1 Kilometer
Scale - 1:20000

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

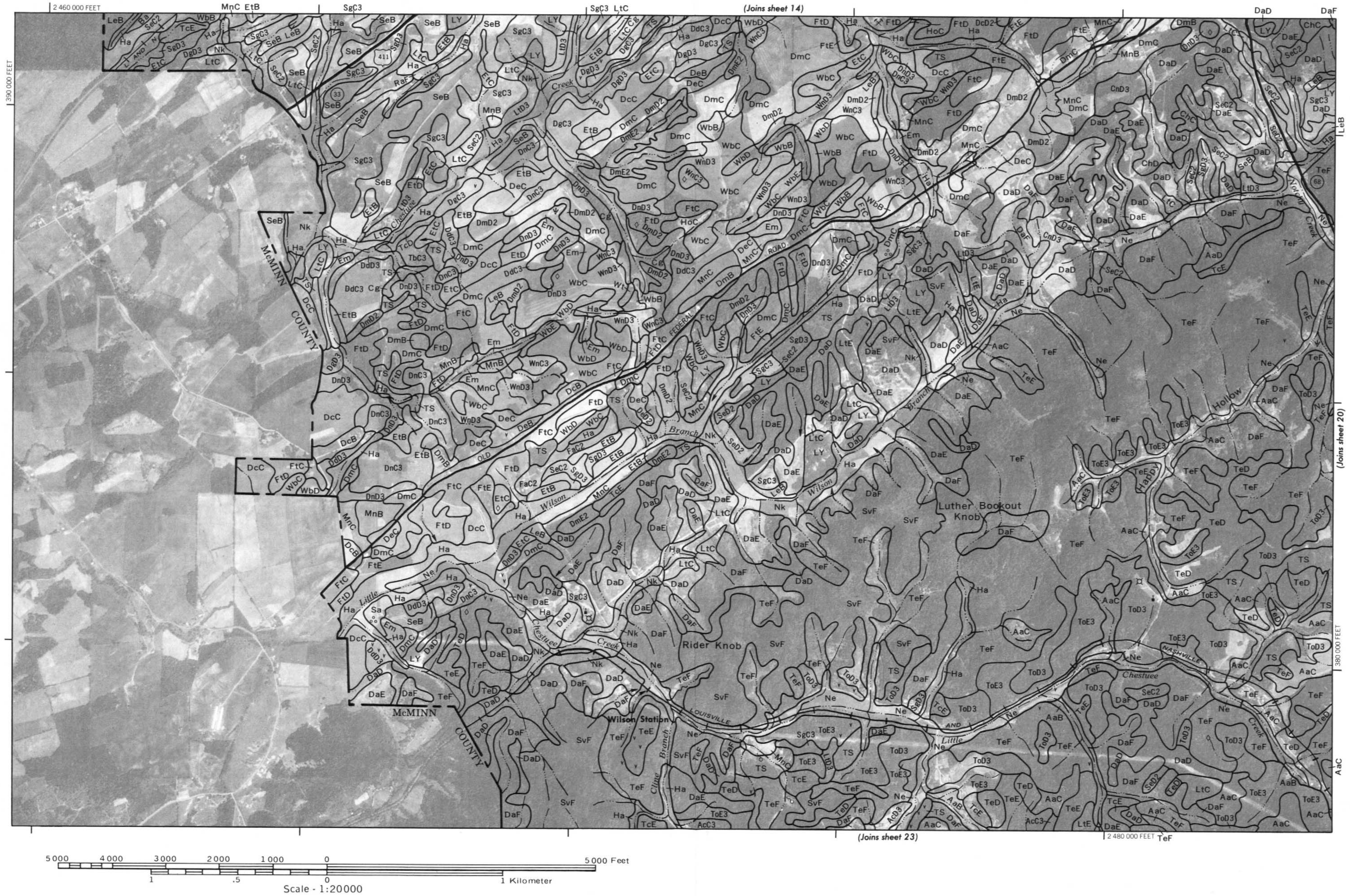
MONROE COUNTY, TENNESSEE NO. 18

MONROE COUNTY, TENNESSEE NO. 19

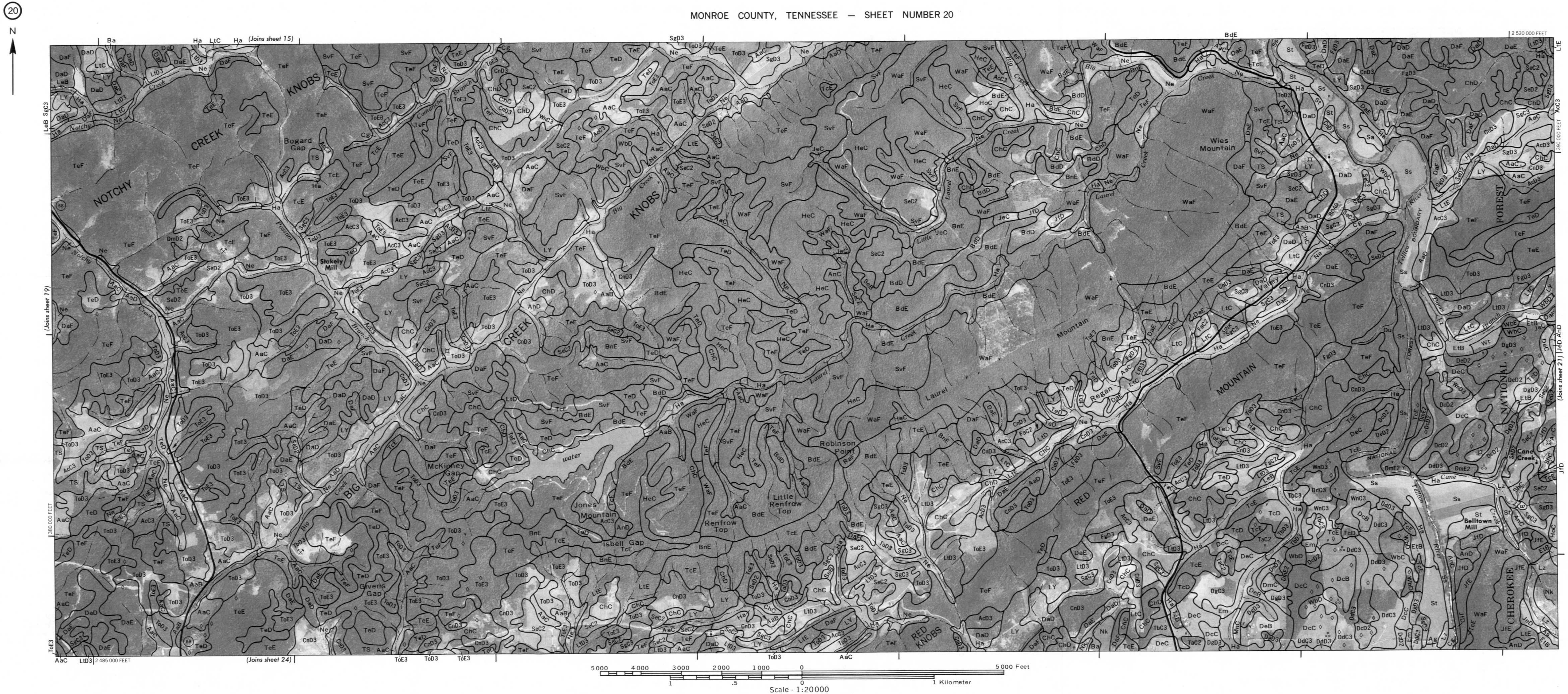
This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.


2 440 000 FEET
(Joins inset, sheet 14)
450 000 FEET
LOUDON COUNTY
McMINN COUNTY
Pond Creek
Mud Creek
Ridge
Watson
(Joins sheet 3)
440 000 FEET
2 445 000 FEET
(Joins inset A, sheet 34)

MONROE COUNTY, TENNESSEE — SHEET NUMBER 19


19
N
2 460 000 FEET
(Joins sheet 14)
390 000 FEET
McMINN COUNTY
Luther Bookout Knob
Rider Knob
Wilson Station
Wilson Branch
Little Chestuee Creek
Chestuee Creek
Hollow
LOUISVILLE AND NASHVILLE
OLD FEDERAL ROAD
(Joins sheet 20)
380 000 FEET
(Joins sheet 23)
2 480 000 FEET
5000 4000 3000 2000 1000 0 5000 Feet
1 .5 0 1 Kilometer
Scale - 1:20000

MONROE COUNTY, TENNESSEE — SHEET NUMBER 20



20
N
(Joins sheet 15)
(Joins sheet 19)
(Joins sheet 21)
(Joins sheet 24)
2 520 000 FEET
390 000 FEET
380 000 FEET
2 485 000 FEET
NOTCHY CREEK KNOBS
Notchy Creek
Bogard Gap
Stakely Mill
Comanche Branch
Possum Branch
BIG CREEK KNOBS
Big Creek
BIG CREEK
McKinney Gap
Jones Mountain
Isbell Gap
Givens Gap
water
Renfrow Top
Little Renfrow Top
Robinson Point
Laurel Creek
Little Laurel
Wies Mountain
Regan
Laurel Mountain
RED MOUNTAIN
RED KNOBS
Dans Valley
Tellico River
BOUNDARY
FOREST
NATIONAL
CHEROKEE NATIONAL FOREST
Cane Creek
Belltown Mill
5000 4000 3000 2000 1000 0 5000 Feet
1 .5 0 1 Kilometer
Scale - 1:20000

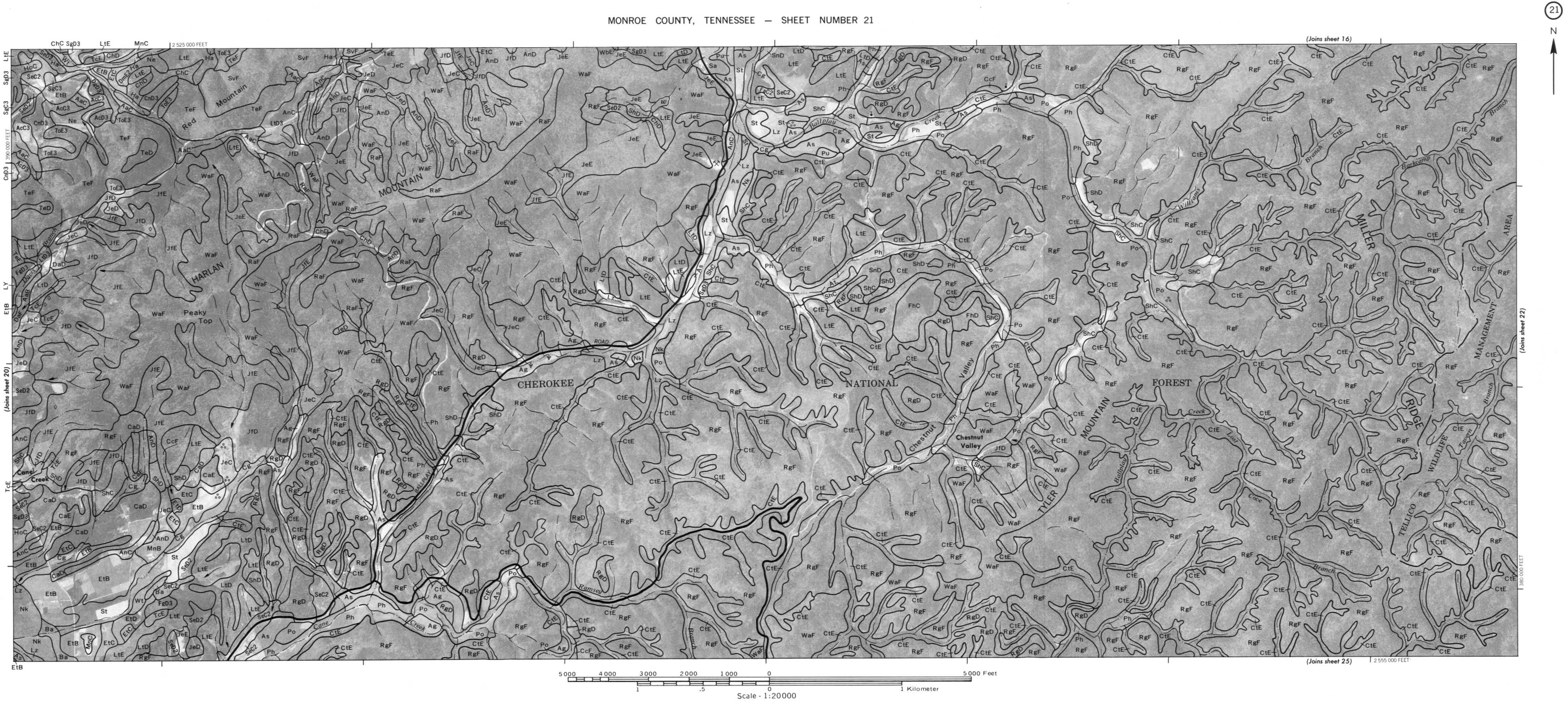
This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

MONROE COUNTY, TENNESSEE NO. 20

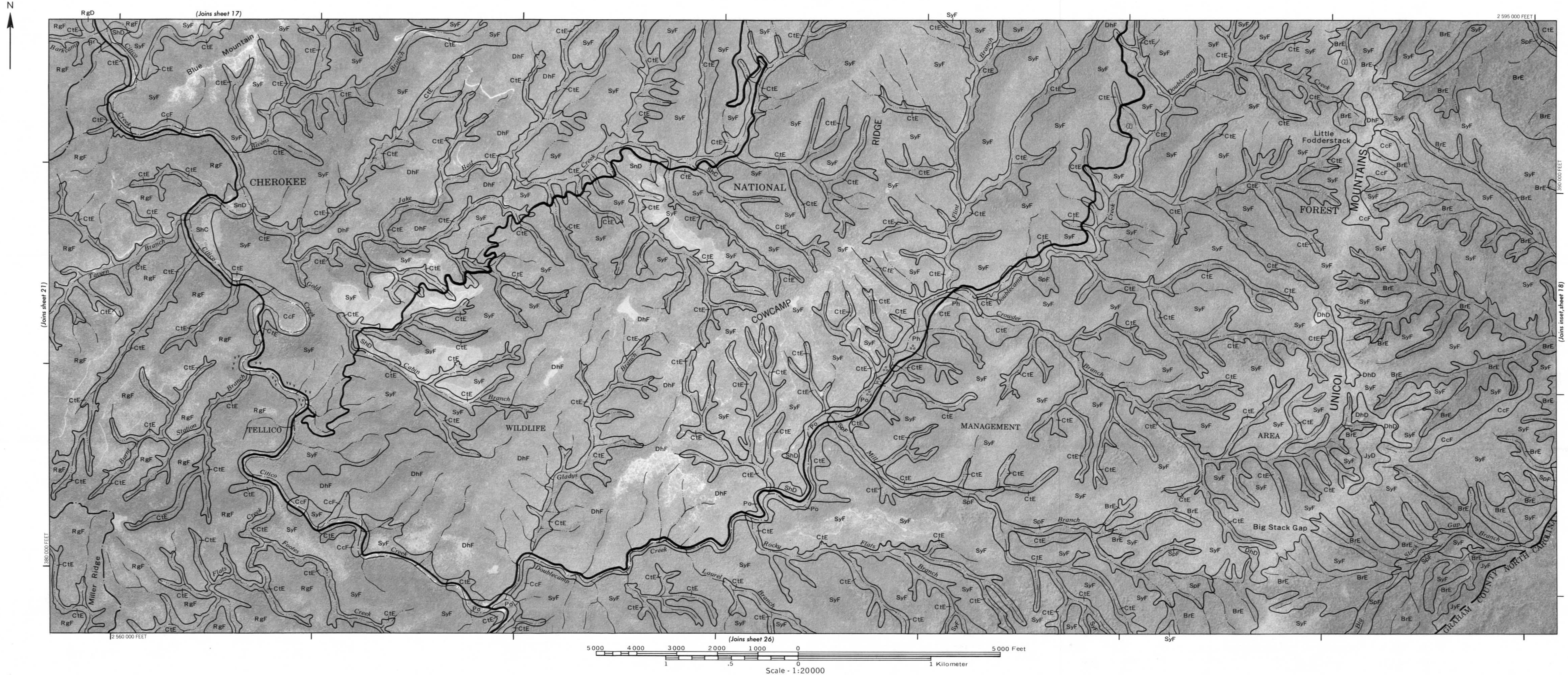
MONROE COUNTY, TENNESSEE — SHEET NUMBER 21

MONROE COUNTY, TENNESSEE NO. 21

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.


21
N
(Joins sheet 16)
(Joins sheet 20)
(Joins sheet 22)
(Joins sheet 25)
2 525 000 FEET
390 000 FEET
380 000 FEET
2 555 000 FEET
Red Mountain
HARLAN MOUNTAIN
Peaky Top
CHEROKEE NATIONAL FOREST
ROAD
BALLPLAY
Ballplay Creek
Chestnut Valley
Chestnut
TYLER MOUNTAIN
MILLER RIDGE
TELLICO WILDLIFE MANAGEMENT AREA
Williams Branch
Barkcamp Branch
Canyon Branch
Lost Creek
Cove Branch
Ramsey Branch
Cane Creek
Conasauga Creek
Davis Branch
5000 4000 3000 2000 1000 0 5000 Feet
1 .5 0 1 Kilometer
Scale - 1:20000

MONROE COUNTY, TENNESSEE — SHEET NUMBER 22


N
(Joins sheet 17)
(Joins sheet 21)
(Joins inset, sheet 18)
(Joins sheet 26)
2 595 000 FEET
390 000 FEET
380 000 FEET
2 560 000 FEET
Blue Mountain
CHEROKEE
NATIONAL
FOREST
COWCAMP
RIDGE
WILDLIFE
MANAGEMENT
AREA
TELLICO
UNICOI
MOUNTAINS
Little Fodderstack
Big Stack Gap
Miller Ridge
GRAHAM COUNTY NORTH CAROLINA
Barkcamp Br
Citico Creek
Bivens Creek
Jake Best Creek
Branch
Tavern Branch
Gold Creek
Cabin Branch
Station Branch
Burnt
Footes Creek
Flats Creek
Doublecamp Creek
Laurel Branch
Rocky Flats Branch
Mill Creek
Crowder Branch
Flint Branch
Gladys Branch
Big Stack Gap Branch
RgD
RgF
ShD
ShC
SnD
SnC
SyF
CtE
CcF
DhF
DhD
DhD
BrE
CcF
JyD
JyF
SpF
Ph
Po
5 000
4 000
3 000
2 000
1 000
0
5 000 Feet
1
.5
0
1 Kilometer
Scale - 1:20000

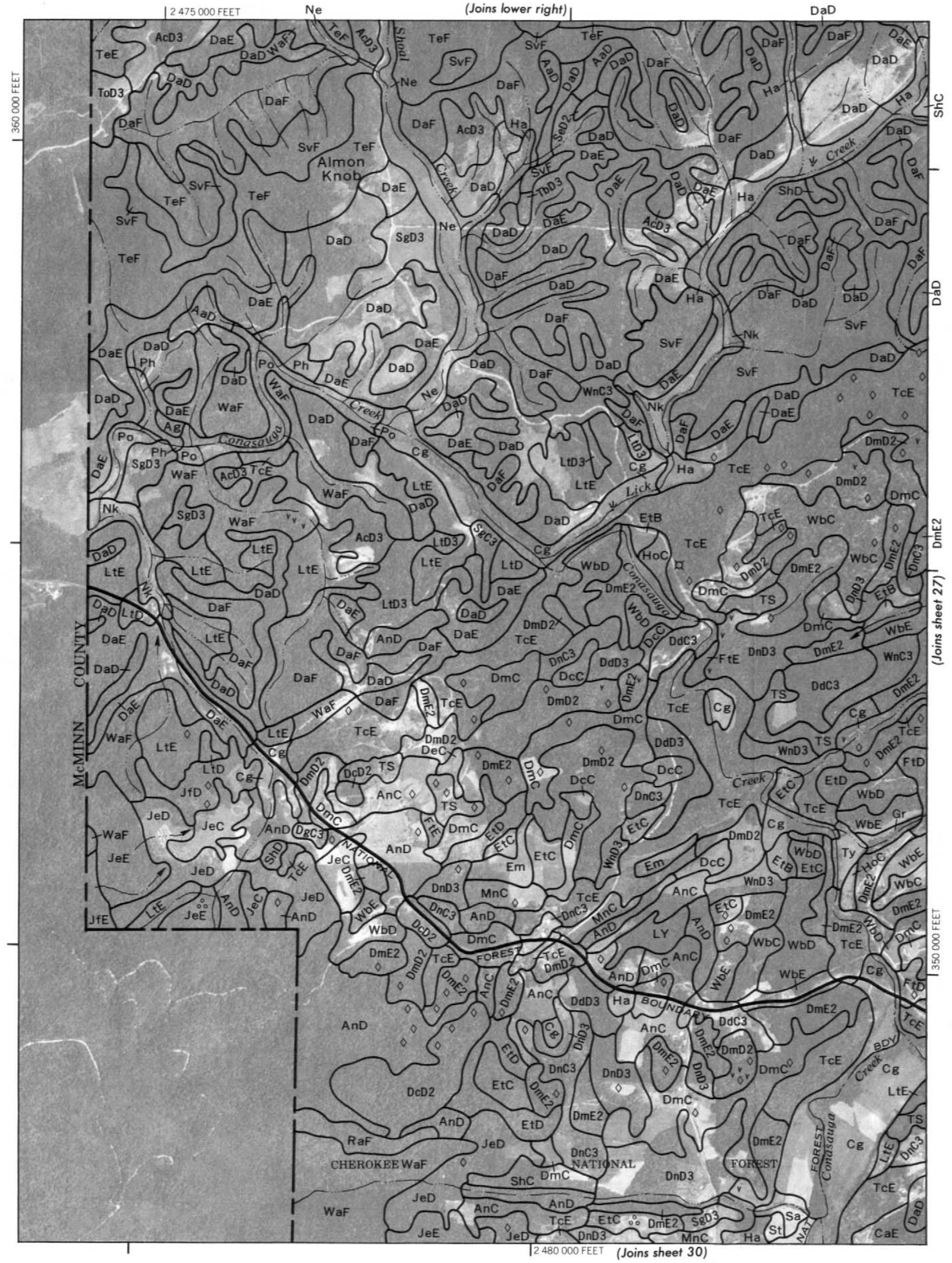
This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

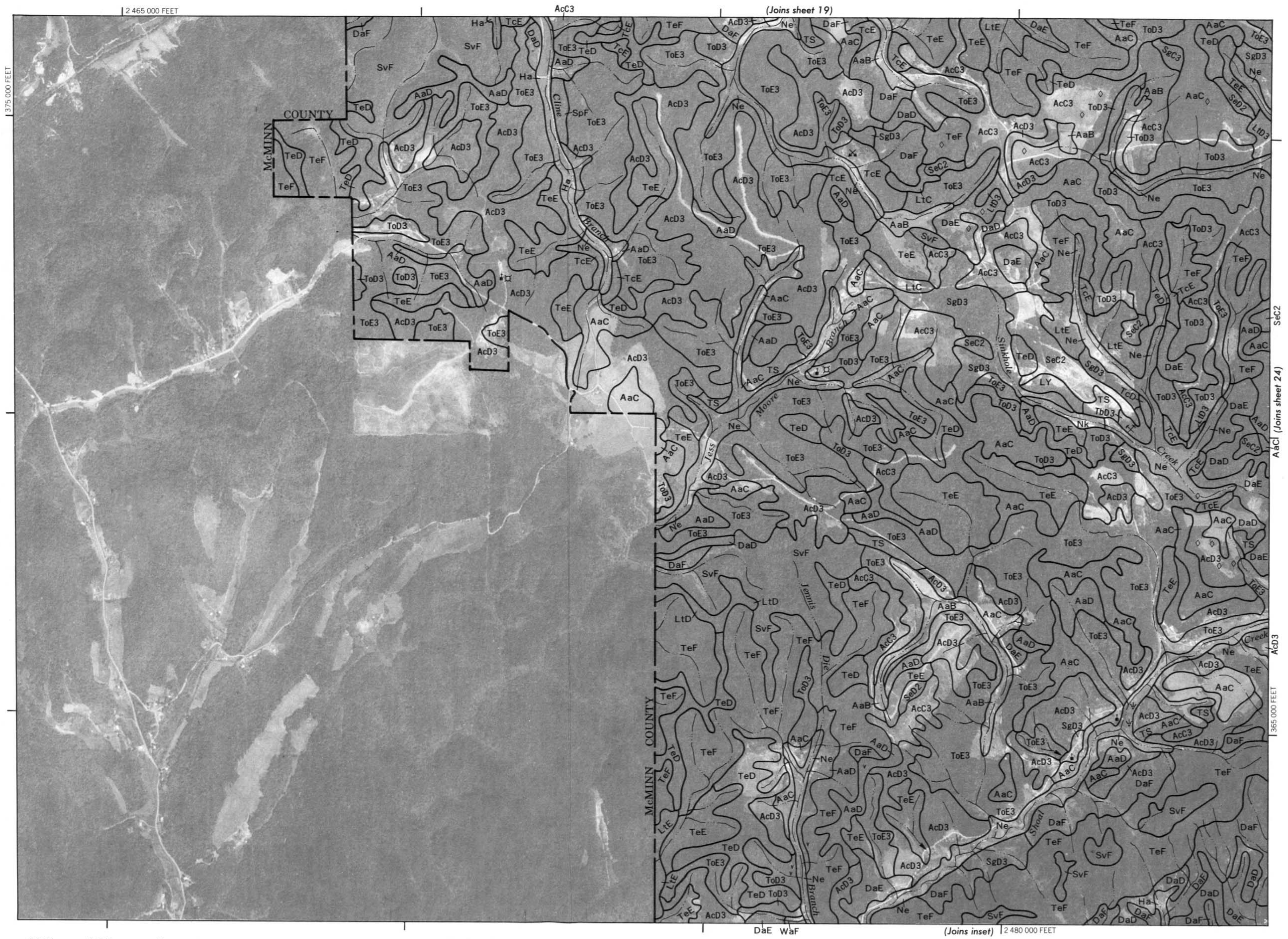
MONROE COUNTY, TENNESSEE NO. 22

MONROE COUNTY, TENNESSEE — SHEET NUMBER 23

MONROE COUNTY, TENNESSEE NO. 23

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.


2 475 000 FEET
(Joins lower right)
360 000 FEET
350 000 FEET
Almon Knob
McMINN COUNTY
Conasauga Creek
Lick Creek
(Joins sheet 27)
CHEROKEE NATIONAL FOREST
2 480 000 FEET
(Joins sheet 30)


2 465 000 FEET
(Joins sheet 19)
375 000 FEET
McMINN COUNTY
(Joins sheet 24)
365 000 FEET
(Joins inset)
2 480 000 FEET
N

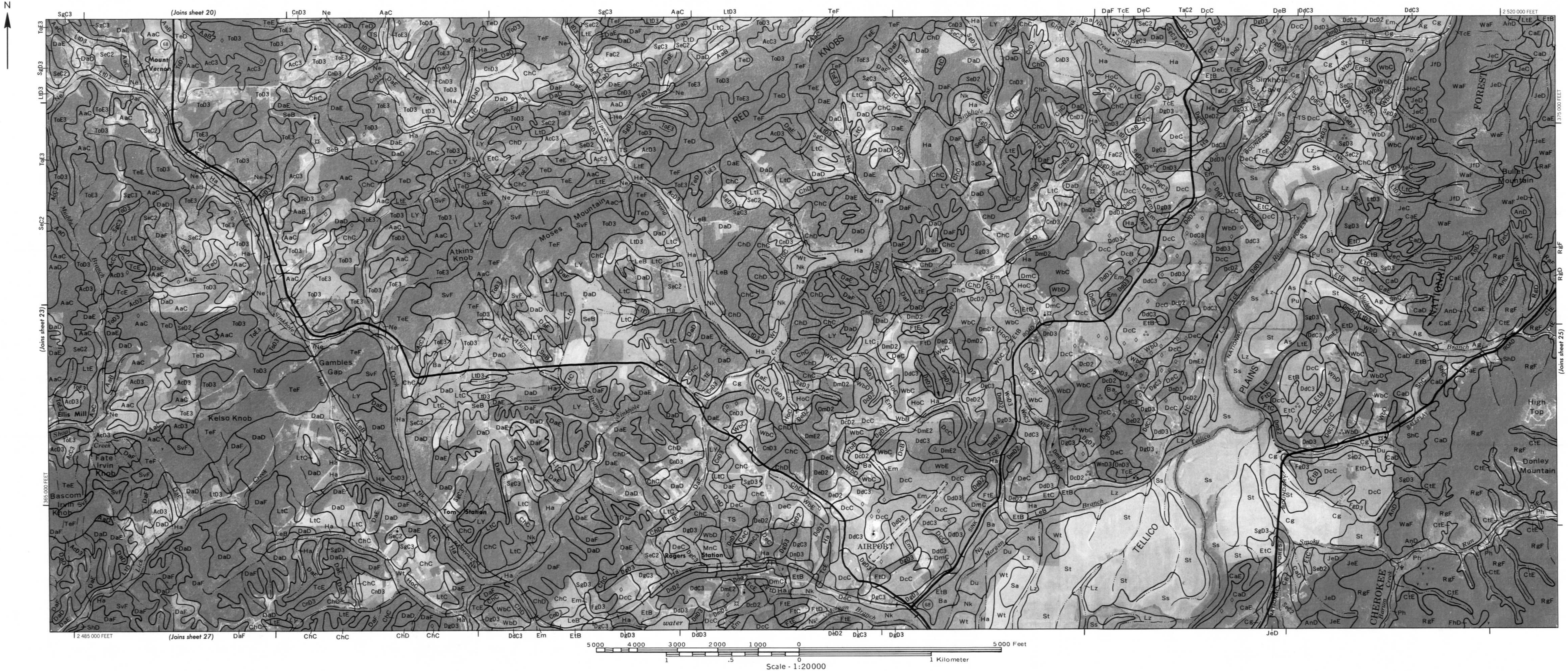
5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

1 .5 0 1 Kilometer

Scale - 1:20000

㉔

MONROE COUNTY, TENNESSEE — SHEET NUMBER 24


N
(Joins sheet 20)
(Joins sheet 23)
(Joins sheet 25)
(Joins sheet 27)
2 520 000 FEET
375 000 FEET
365 000 FEET
2 485 000 FEET
Mount Vernon
RED KNOBS
Moses Mountain
Atkins Knob
Gambles Gap
Kelso Knob
Ellis Mill
Fate Irvin Knob
Bascom Irvin Knob
Tom Station
Rogers Station
AIRPORT
Sinkhole Cave
TELLICO PLAINS
NATIONAL
FOREST
CHEROKEE
Bullet Mountain
High Top
Donley Mountain
Tellico
Smoky
Morgan Branch
water
5 000 4 000 3 000 2 000 1 000 0 5 000 Feet
1 .5 0 1 Kilometer
Scale - 1:20000

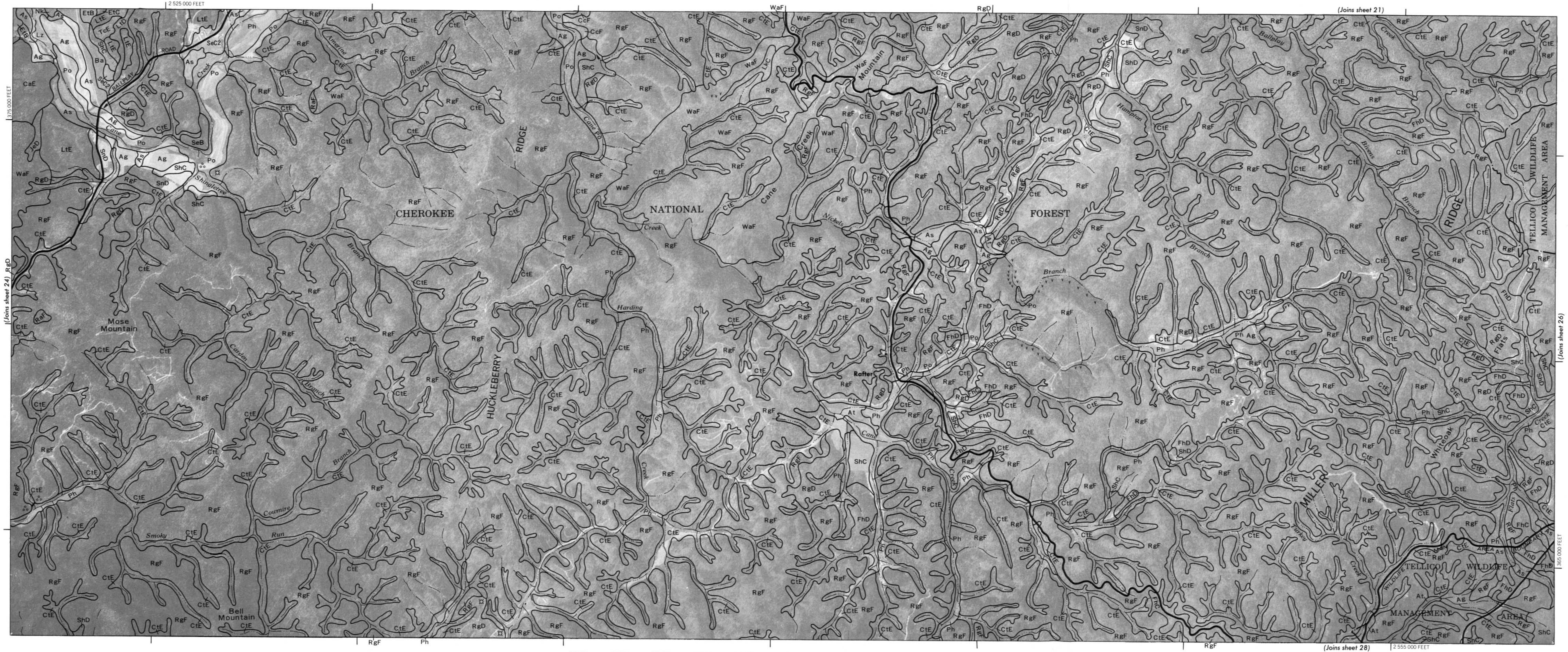
This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

MONROE COUNTY, TENNESSEE NO. 24

N

MONROE COUNTY, TENNESSEE NO. 25

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

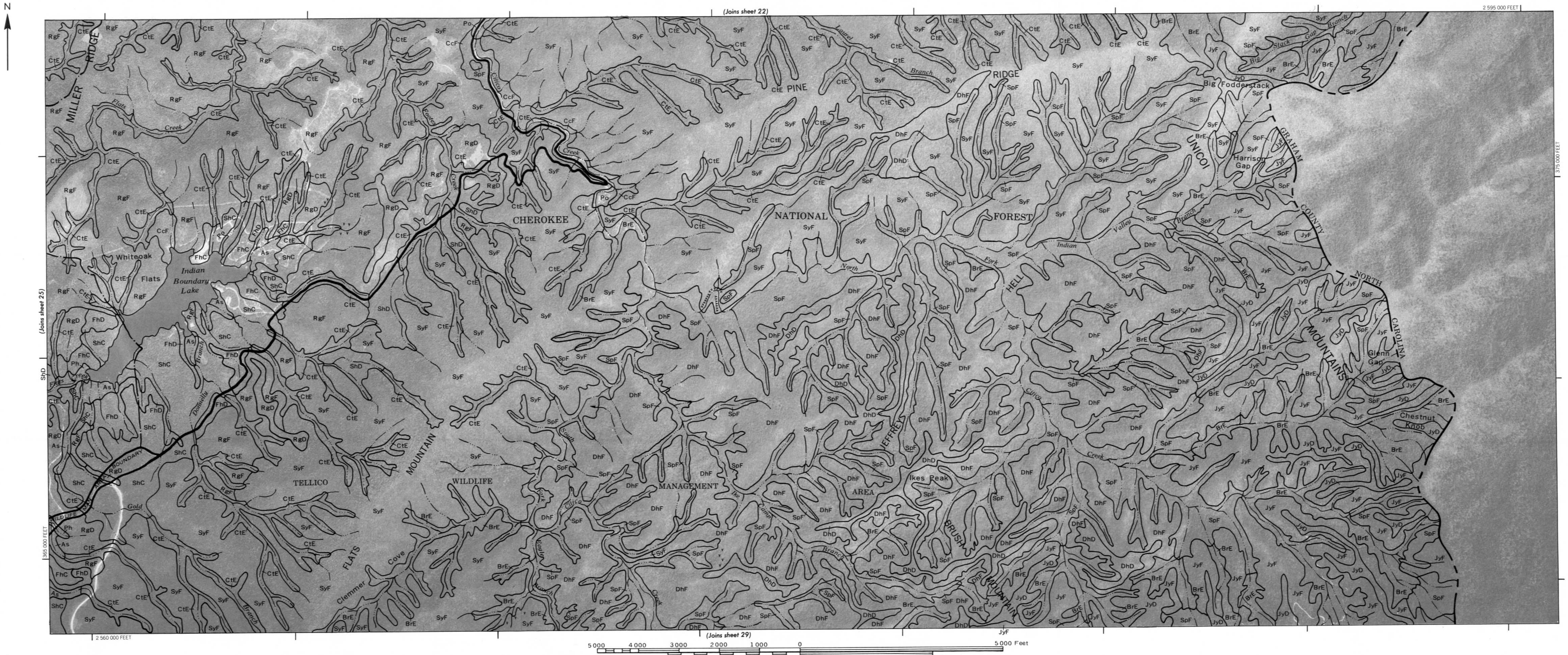

2 525 000 FEET
375 000 FEET
(Joins sheet 21)
(Joins sheet 24)
(Joins sheet 26)
(Joins sheet 28)
365 000 FEET
2 555 000 FEET
CHEROKEE
NATIONAL
FOREST
HUCKLEBERRY
RIDGE
Mose Mountain
Bell Mountain
Waf Mountain
MILLER
RIDGE
TELLICO WILDLIFE MANAGEMENT AREA
Rafter
BALLPLAY ROAD
Cane Creek
Shingletree
Ameline Branch
Nichols Creek
Harding Creek
Canden Branch
Coumire Run
Smoky
Hampton
Bivens Branch
Whiteoak Flats Creek
Ballplay Creek
Parks Creek
Branch
RgF
CtE
RgD
WaF
FhD
ShC
Ph
Ag
As
Po

5000 4000 3000 2000 1000 0 5000 Feet

1 .5 0 1 Kilometer

Scale - 1:20000

MONROE COUNTY, TENNESSEE — SHEET NUMBER 26


N
(Joins sheet 22)
(Joins sheet 25)
(Joins sheet 29)
2 595 000 FEET
375 000 FEET
365 000 FEET
2 560 000 FEET
MILLER RIDGE
Flats Creek
Whiteoak Flats
Indian Boundary Lake
Donnelly Branch
TELLICO WILDLIFE MANAGEMENT AREA
CHEROKEE NATIONAL FOREST
PINE RIDGE
Laurel Branch
Citico Creek
Eagle Creek
North Fork
Indian Valley Branch
HELL
FLATS MOUNTAIN
Clemmer Cove
South Fork
Gold
JEFFREY
Ikes Peak
BRUSH MOUNTAIN
Camp Branch
UNICOI MOUNTAINS
Big Fodderstack
Big Stack Gap Branch
Harrison Gap
GRAHAM COUNTY
NORTH CAROLINA
Glenn Gap
Chestnut Knob
5000 4000 3000 2000 1000 0 5000 Feet
1 .5 0 1 Kilometer

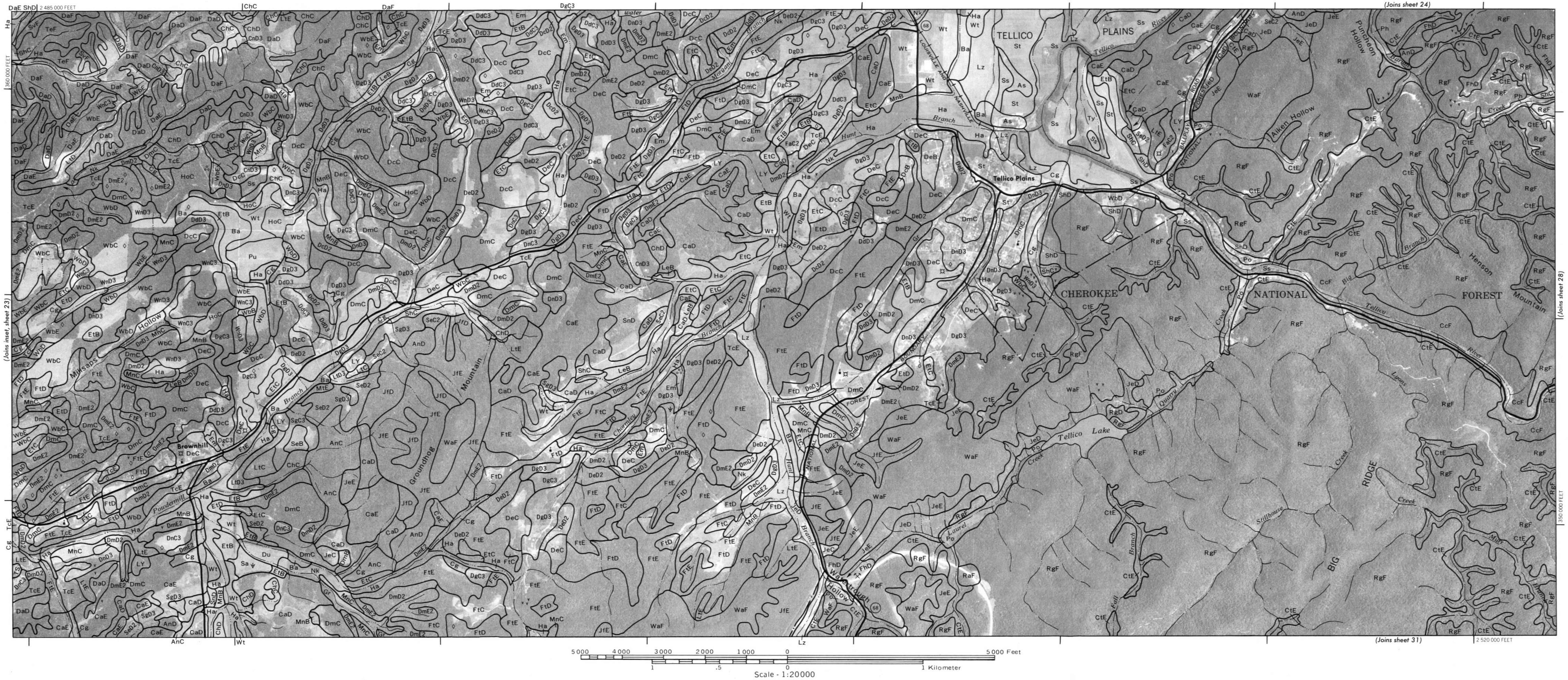
Scale - 1:20000

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

MONROE COUNTY, TENNESSEE — SHEET NUMBER 27

MONROE COUNTY, TENNESSEE NO. 27

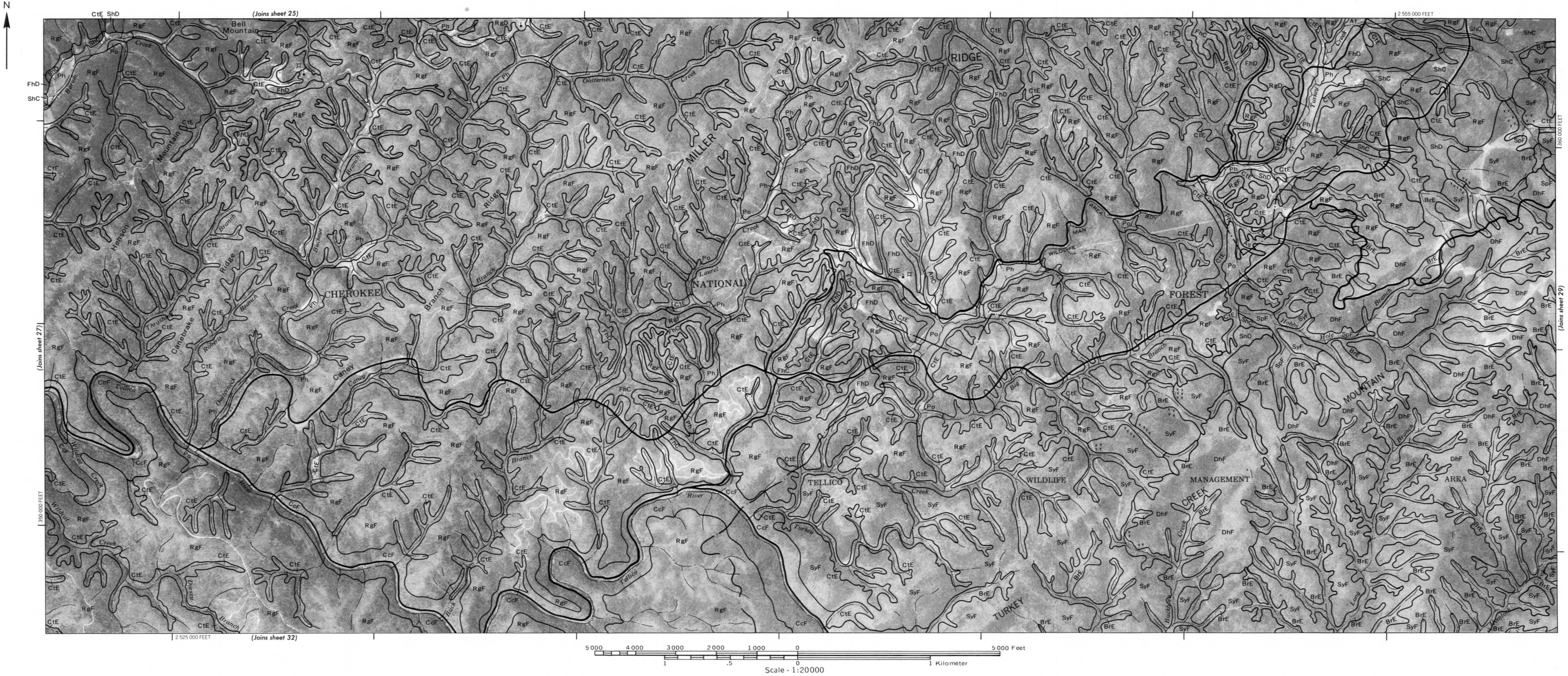
This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.



27
N
2 485 000 FEET
350 000 FEET
(Joins sheet 24)
(Joins inset, sheet 23)
(Joins sheet 28)
(Joins sheet 31)
2 520 000 FEET
TELLICO PLAINS
Tellico Plains
CHEROKEE NATIONAL FOREST
BIG RIDGE
Henson Mountain
Groundhog Mountain
Millsaps Hollow
Brownhill
Powdermill
Tellico Lake
Tellico River
Aiken Hollow
Puncheon Hollow
Waucheesi Hollow
Stillhouse Creek
Laurel Creek
Quarry Creek
Lyons Creek
Big Creek
Hunt Branch
Margaret Branch
Chestnut Branch
Fall Branch
68
5000 4000 3000 2000 1000 0 5000 Feet
1 .5 0 1 Kilometer

Scale - 1:20000

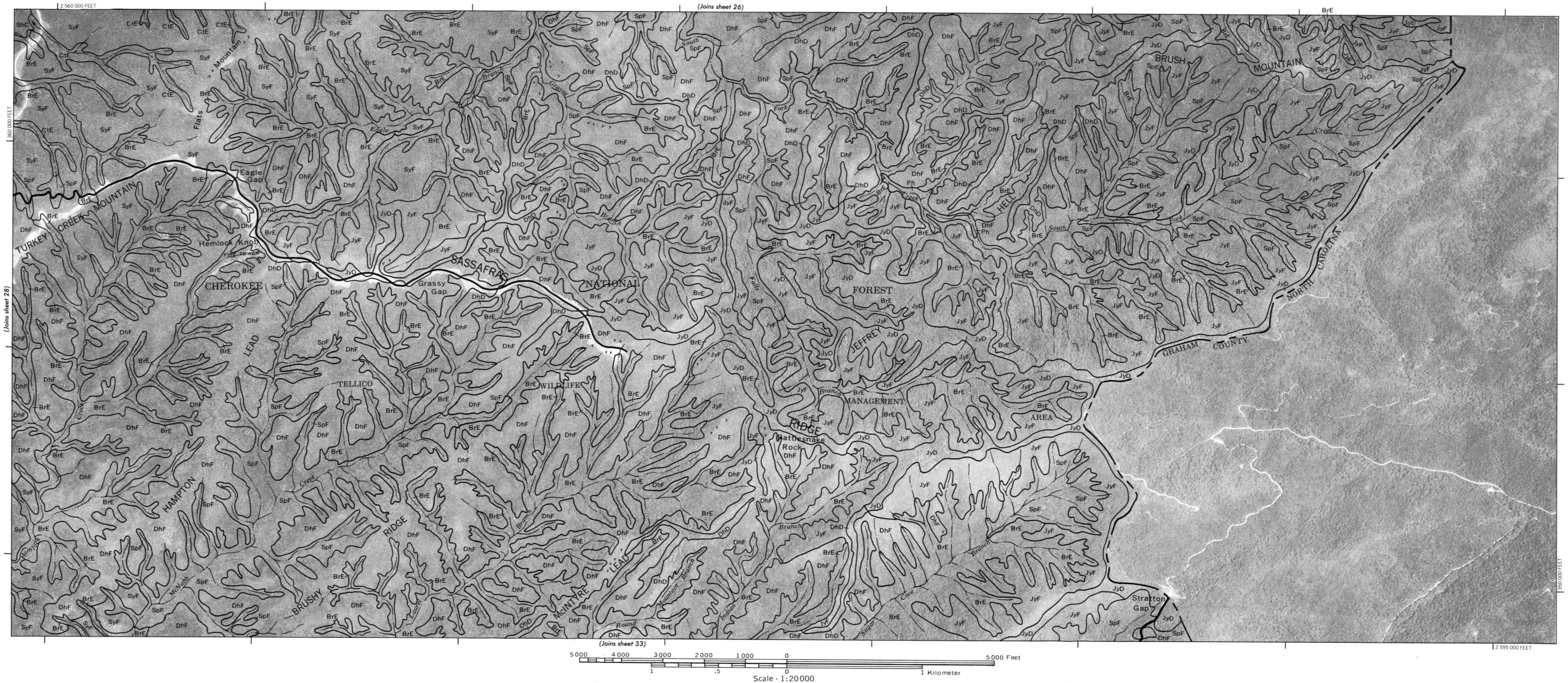
MONROE COUNTY, TENNESSEE — SHEET NUMBER 28


N
(Joins sheet 25)
(Joins sheet 27)
(Joins sheet 29)
(Joins sheet 32)
2 555 000 FEET
360 000 FEET
350 000 FEET
2 525 000 FEET
Bell Mountain
RIDGE
MILLER
NATIONAL
CHEROKEE
FOREST
MOUNTAIN
TELLICO
WILDLIFE
MANAGEMENT
AREA
TURKEY
CREEK
Henson Mountain
Canebrake Ridge
Roberts Branch
Oosterneck Creek
Buckeye Branch
Caney Creek
Laurel Branch
Tellico River
Wildcat Creek
Dorsey Branch
Turkey Creek
Big Cove Branch
Hobbs Branch
Holly Branch
Buck Branch
Rough Ridge
CtE
RgF
Ph
Po
FhD
FhC
ShD
ShC
RgD
CcF
SyF
BrE
DhF
SpF
SnD
5 000
4 000
3 000
2 000
1 000
0
5 000 Feet
1
.5
0
1 Kilometer
Scale - 1:20000

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

N

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

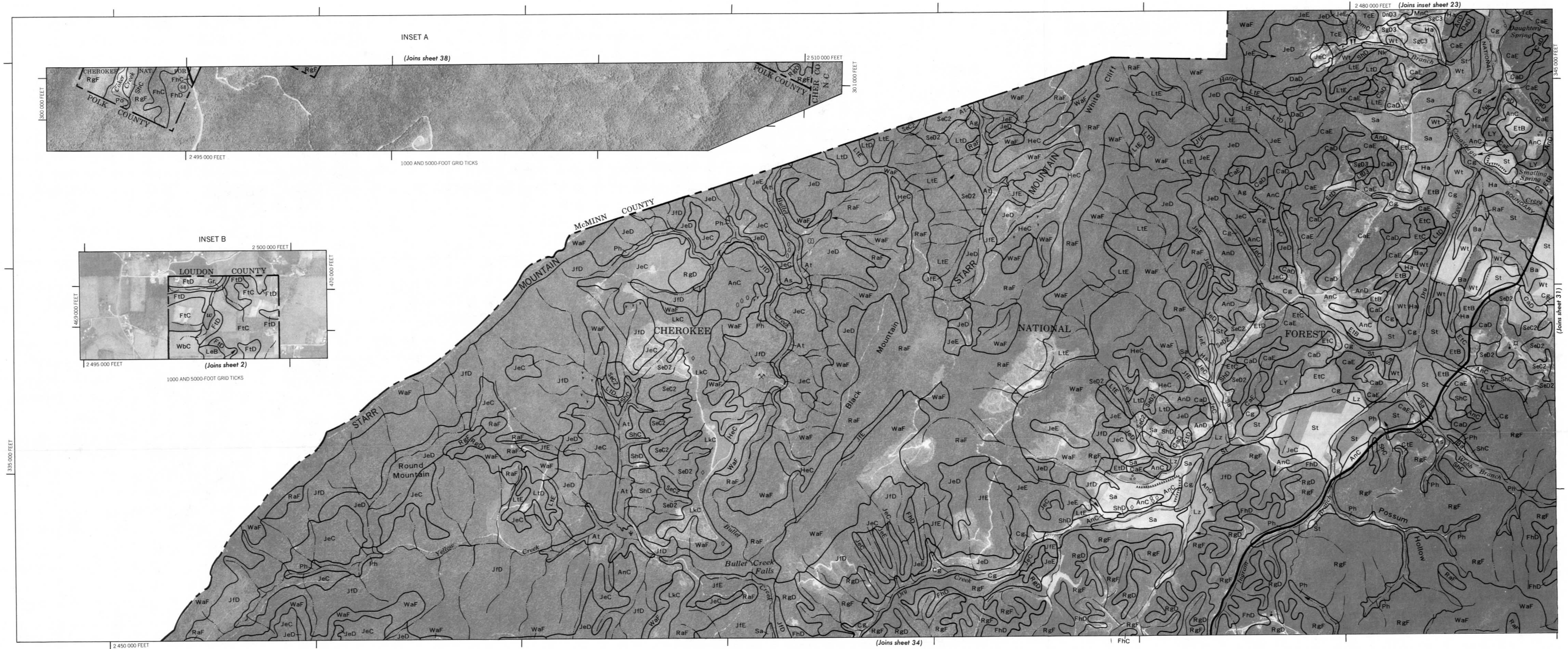

2 560 000 FEET
(Joins sheet 26)
360 000 FEET
(Joins sheet 28)
(Joins sheet 33)
2 595 000 FEET
350 000 FEET
TURKEY CREEK MOUNTAIN
Flats Mountain
Eagle Gap
Hemlock Knob
FIRE TOWER
CHEROKEE NATIONAL FOREST
SASSAFRAS RIDGE
Grassy Gap
LEAD
TELLICO WILDLIFE MANAGEMENT AREA
HAMPTON RIDGE
BRUSHY RIDGE
McINTYRE LEAD
JEFFREY RIDGE
Rattlesnake Rock
HELL
BRUSH MOUNTAIN
NORTH CAROLINA
GRAHAM COUNTY
Stratton Gap
Eagle
Grassy
Branch
South Fork
Falls
Citico Creek
Creek
McNabb
Laurel
Mountain Branch
Indian
Round
Sugar Cove
ShC
SyF
CtE
BrE
DhF
DhD
SpF
JyF
JyD
Ph
5 000 4 000 3 000 2 000 1 000 0 5 000 Feet
1 .5 0 1 Kilometer

Scale - 1:20000

(30)

N

MONROE COUNTY, TENNESSEE — SHEET NUMBER 30



INSET A
(Joins sheet 38)
2 510 000 FEET
301 000 FEET
300 000 FEET
2 495 000 FEET
1000 AND 5000-FOOT GRID TICKS
CHEROKEE NAT FOR
POLK COUNTY
POLK COUNTY
CHER CO N.C.
Coker Creek
INSET B
2 500 000 FEET
470 000 FEET
469 000 FEET
2 495 000 FEET
LOUDON COUNTY
(Joins sheet 2)
1000 AND 5000-FOOT GRID TICKS
2 480 000 FEET
(Joins inset sheet 23)
345 000 FEET
335 000 FEET
2 450 000 FEET
(Joins sheet 31)
(Joins sheet 34)
McMINN COUNTY
STARR MOUNTAIN
STARR MOUNTAIN
CHEROKEE NATIONAL FOREST
White Cliff
Black Mountain
Round Mountain
Bullet Creek
Bullet Creek Falls
Yellow Creek
Dry Creek
Possum Hollow
Webb Branch
Daughtery Spring
Smalling Spring
Hatter Branch
BOUNDARY

Scale - 1:20000

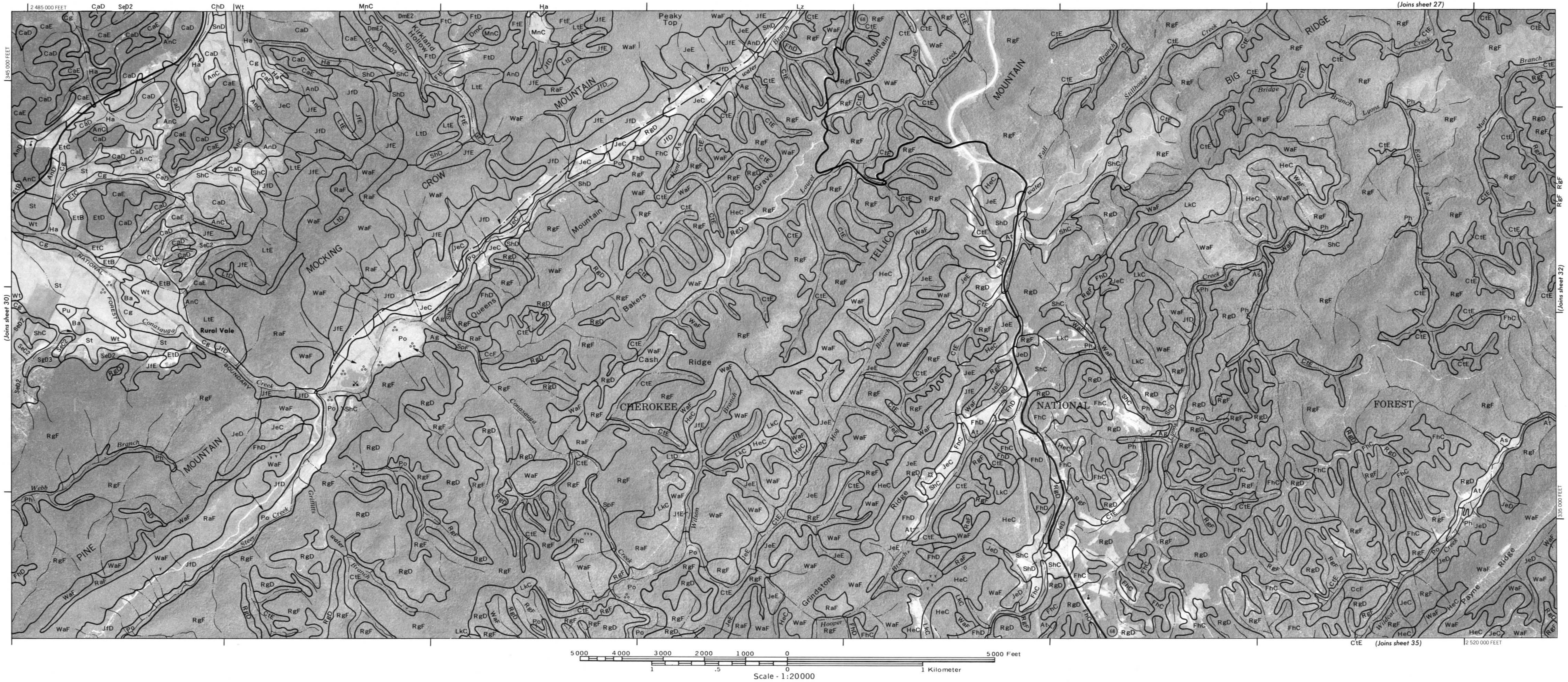
5000 4000 3000 2000 1000 0 5000 Feet

1 .5 0 1 Kilometer

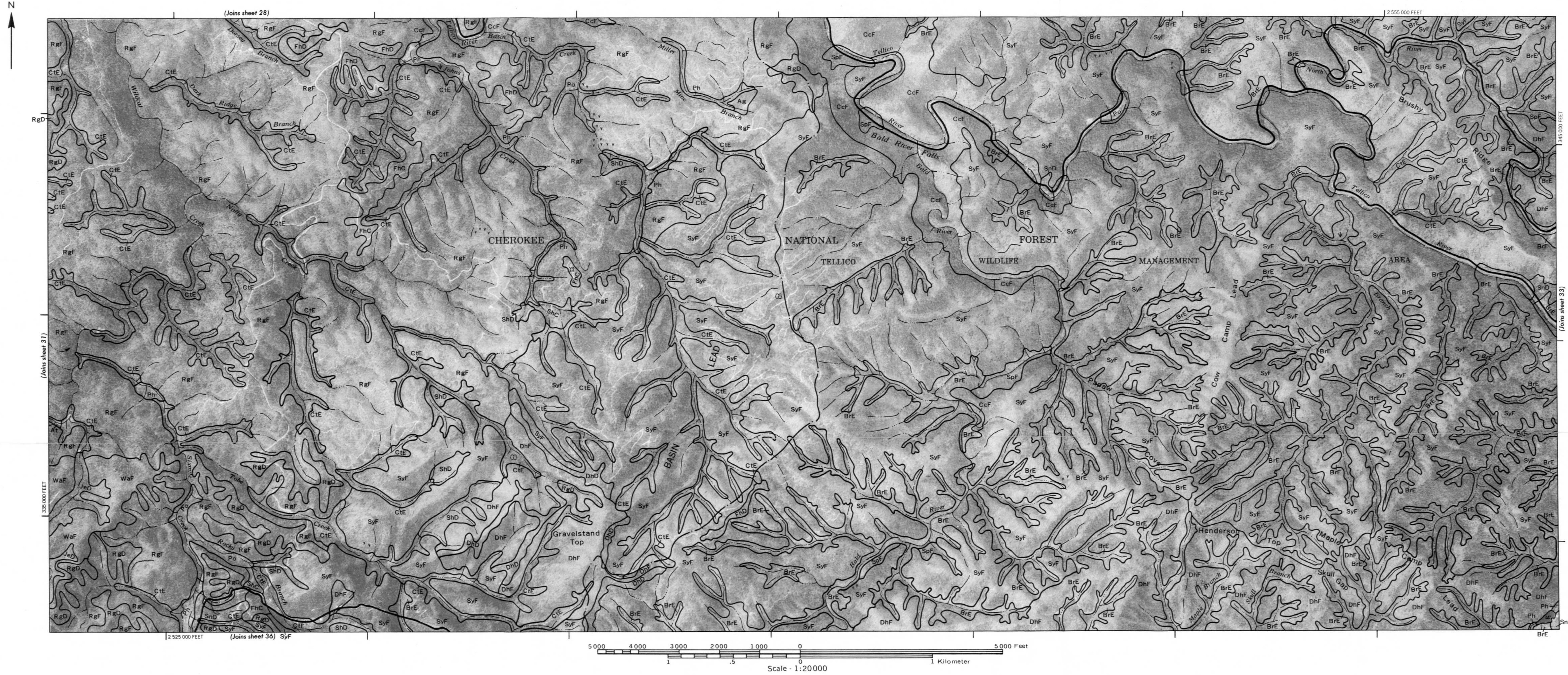
This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

MONROE COUNTY, TENNESSEE — SHEET NUMBER 31

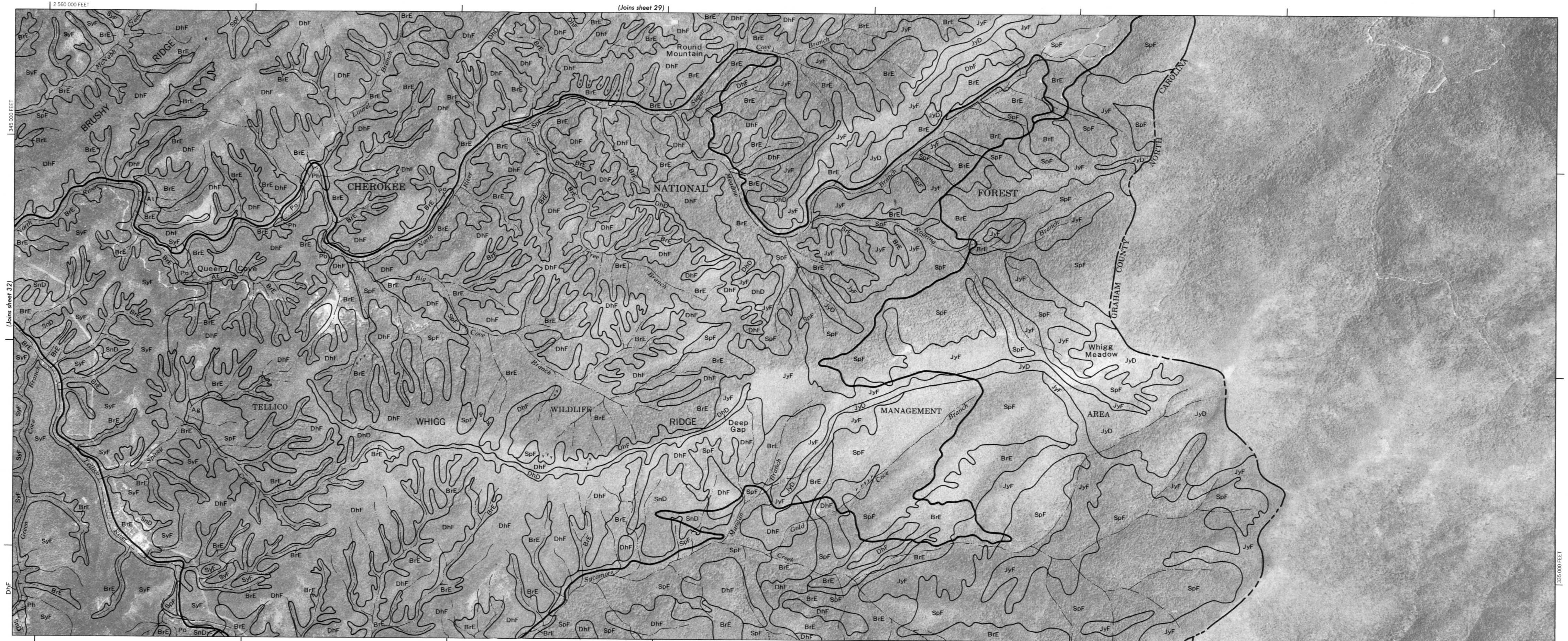
This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.


N
2 485 000 FEET
345 000 FEET
335 000 FEET
2 520 000 FEET
(Joins sheet 27)
(Joins sheet 30)
(Joins sheet 32)
(Joins sheet 35)
Peaky Top
Kirkland Hollow
CROW MOUNTAIN
MOCKING
Mountain
NATIONAL FOREST BOUNDARY
Rural Vale
Conasauga Creek
Queens
Bakers
Cash Ridge
CHEROKEE
NATIONAL
FOREST
TELLICO
Mountain
MOUNTAIN
BIG RIDGE
Laurel Branch
Grave
Wilson Creek
Hoe
Grindstone
Hooper
Ridge
Payne Ridge
Stillhouse Branch
Bridge Branch
Lyons
Spur
Fall water
East Fork
Mun
Branch
PINE MOUNTAIN
Webb Branch
Po Creek
Griffith
Steer Creek
water Branch
Wildcat
68
5 000
4 000
3 000
2 000
1 000
0
5 000 Feet
1
.5
0
1 Kilometer
Scale - 1:20000

MONROE COUNTY, TENNESSEE — SHEET NUMBER 32


N
(Joins sheet 28)
(Joins sheet 31)
(Joins sheet 33)
(Joins sheet 36)
2 555 000 FEET
2 525 000 FEET
345 000 FEET
335 000 FEET
CHEROKEE
NATIONAL
FOREST
TELLICO
WILDLIFE
MANAGEMENT
AREA
Tellico River
Bald River
Bald River Falls
North River
Brushy Ridge
Wildcat
Dorsey Branch
Johns Creek
Dark Ridge Branch
Miller Mine Branch
Naugy Creek
Basin Lead
Pheasant
Cow Camp Lead
Cow Cove
Henderson Top
Maple Camp
Skull Gap
Skull Branch
Monk Branch
Gravelstand Top
Sycamore Creek
Rocky Branch
Bald River
Lead
5 000 4 000 3 000 2 000 1 000 0 5 000 Feet
1 .5 0 1 Kilometer
Scale - 1:20000

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.


N
2 560 000 FEET
345 000 FEET
335 000 FEET
2 595 000 FEET
(Joins sheet 29)
(Joins sheet 32)
(Joins sheet 37)
BRUSHY
RIDGE
McNabb Creek
Round Mountain
Cove Branch
Laurel Branch
CHEROKEE
NATIONAL
FOREST
North River
Queen Cove
Big Cove Branch
Tellico River
TELLICO
WHIGG
WILDLIFE
RIDGE
MANAGEMENT
AREA
Whigg Meadow
Deep Gap
Meadow Branch
Roaring Branch
Gold Creek
Sycamore Creek
Green Cove
GRAHAM COUNTY
NORTH CAROLINA
BrE
DhF
DhD
SyF
SpF
JyF
JyD
SnD
Po
Ph
At
Ag

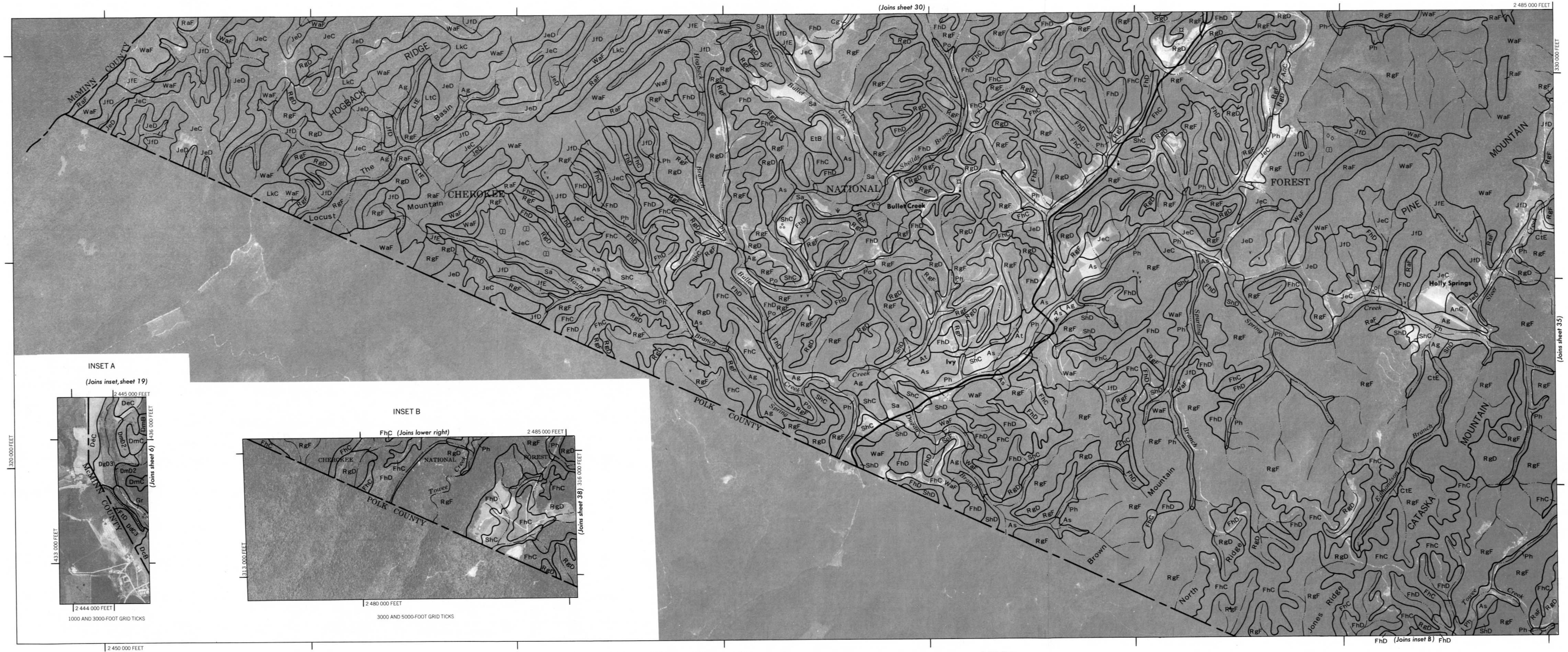
5 000 4 000 3 000 2 000 1 000 0 5 000 Feet
1 .5 0 1 Kilometer
Scale - 1:20000

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

(34)

N

MONROE COUNTY, TENNESSEE — SHEET NUMBER 34



(Joins sheet 30)
(Joins sheet 35)
(Joins inset B)
2 485 000 FEET
330 000 FEET
2 450 000 FEET
McMINN COUNTY
POLK COUNTY
HOGBACK RIDGE
The Basin
Locust Mountain
CHEROKEE
NATIONAL
FOREST
Bullet Creek
Hogback Branch
Sheilds Branch
Ivy
Spring Creek
Duggan Branch
Brown Mountain
North Ridge
Jones Ridge
Spurling Branch
Spring Creek
PINE MOUNTAIN
Holly Springs
Creek
CATASKA MOUNTAIN
Branch
Towee Creek
INSET A
(Joins inset, sheet 19)
2 445 000 FEET
436 000 FEET
320 000 FEET
433 000 FEET
2 444 000 FEET
(Joins sheet 6)
McMINN COUNTY
1000 AND 3000-FOOT GRID TICKS
INSET B
FhC (Joins lower right)
2 485 000 FEET
316 000 FEET
313 000 FEET
2 480 000 FEET
(Joins sheet 38)
CHEROKEE
NATIONAL
FOREST
Towee Creek
POLK COUNTY
3000 AND 5000-FOOT GRID TICKS

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

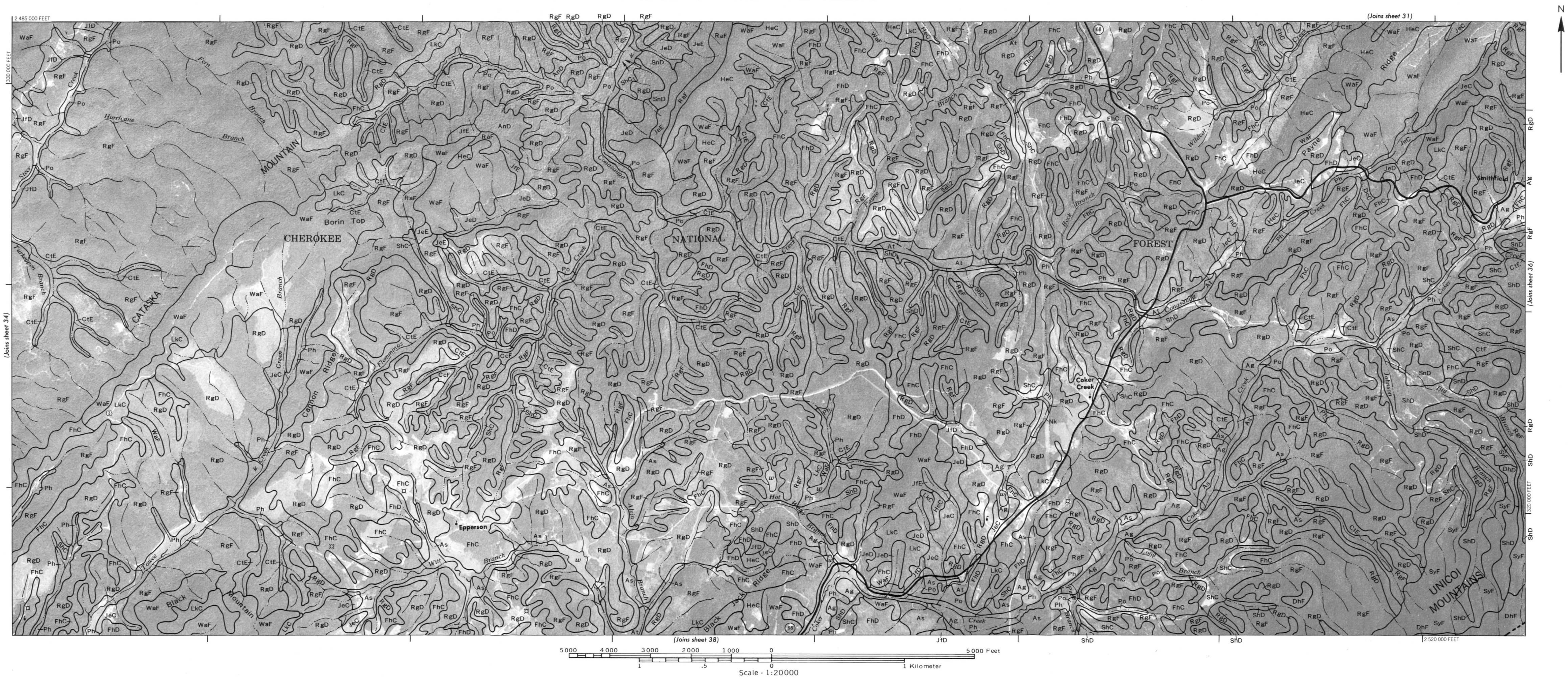
1 .5 0 1 Kilometer

Scale - 1:20000

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

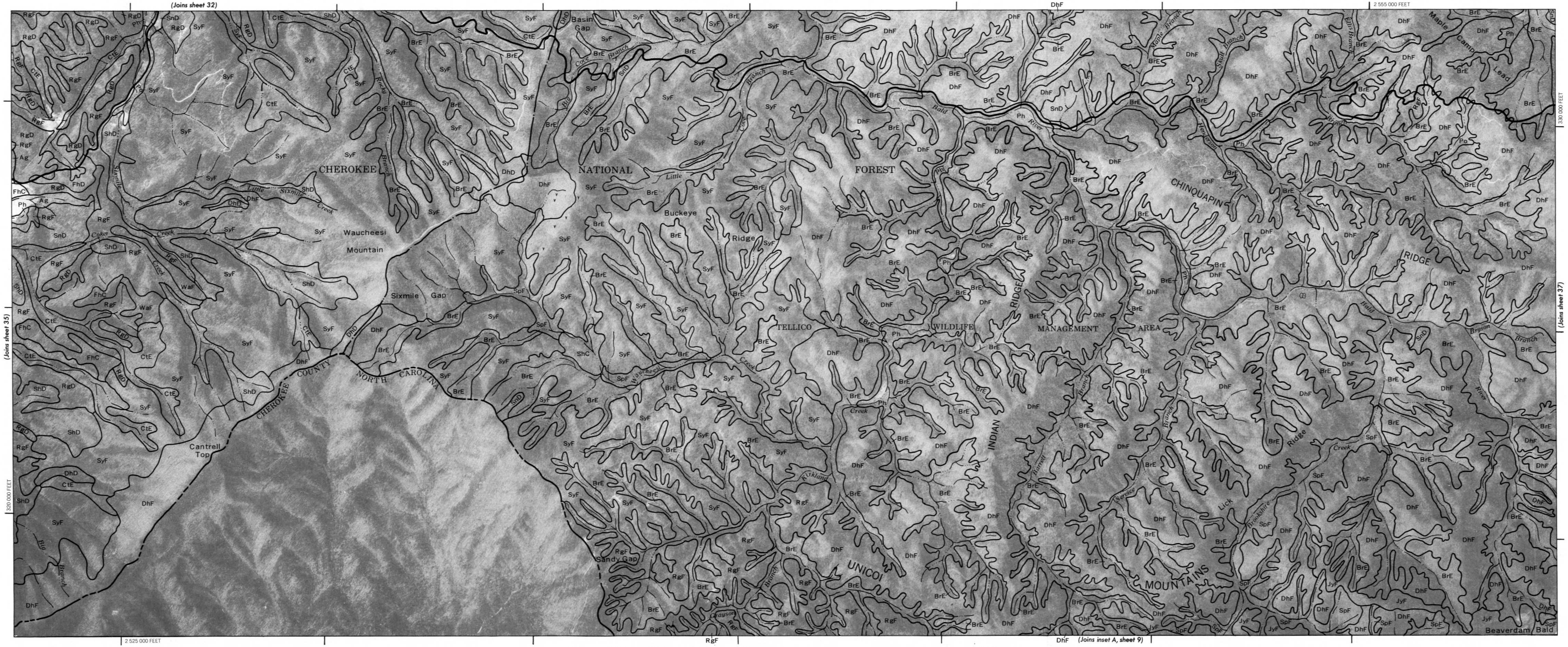
MONROE COUNTY, TENNESSEE — SHEET NUMBER 35

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.


N
2 485 000 FEET
330 000 FEET
(Joins sheet 31)
(Joins sheet 34)
(Joins sheet 36)
(Joins sheet 38)
2 520 000 FEET
CHEROKEE
NATIONAL
FOREST
CATASKA
MOUNTAIN
Borin Top
Cannon Ridge
Black Mountain
Jack Ridge
Payne Ridge
UNICOI MOUNTAINS
Smithfield
Coker Creek
Epperson
Hurricane Branch
Fern Branch
Green Branch
Turkeypen Branch
Flemmings Creek
Conasauga Creek
Beck Branch
Wildcat
Hot Water Branch
Witt Branch
Long Branch
Johnson Bug
Coker Creek
Allen Branch
Doublecamp Creek
68
RgD
RgF
CtE
WaF
FhC
FhD
HeC
LkC
Po
Ph
JfD
JeC
JeD
ShC
ShD
SnD
As
Ag
At
SyF
DhF
AnD
CcF
Nk
5 000
4 000
3 000
2 000
1 000
0
5 000 Feet
1
.5
0
1 Kilometer
Scale - 1:20000

N

MONROE COUNTY, TENNESSEE — SHEET NUMBER 36


(Joins sheet 32)
(Joins sheet 35)
(Joins sheet 37)
(Joins inset A, sheet 9)
2 555 000 FEET
330 000 FEET
320 000 FEET
2 525 000 FEET
CHEROKEE NATIONAL FOREST
Basin Gap
Waucheesi Mountain
Sixmile Gap
Little Sixmile Creek
Coker Creek
Cantrell Top
CHEROKEE COUNTY NORTH CAROLINA
Buckeye Ridge
TELLICO WILDLIFE MANAGEMENT AREA
Waucheesi Creek
Kirkland Creek
INDIAN RIDGE
Bald River
Maple Camp Lead
CHINQUAPIN RIDGE
Bryson Branch
Lick Ridge
UNICOI MOUNTAINS
Sandy Gap
Beaverdam Bald
Big Branch

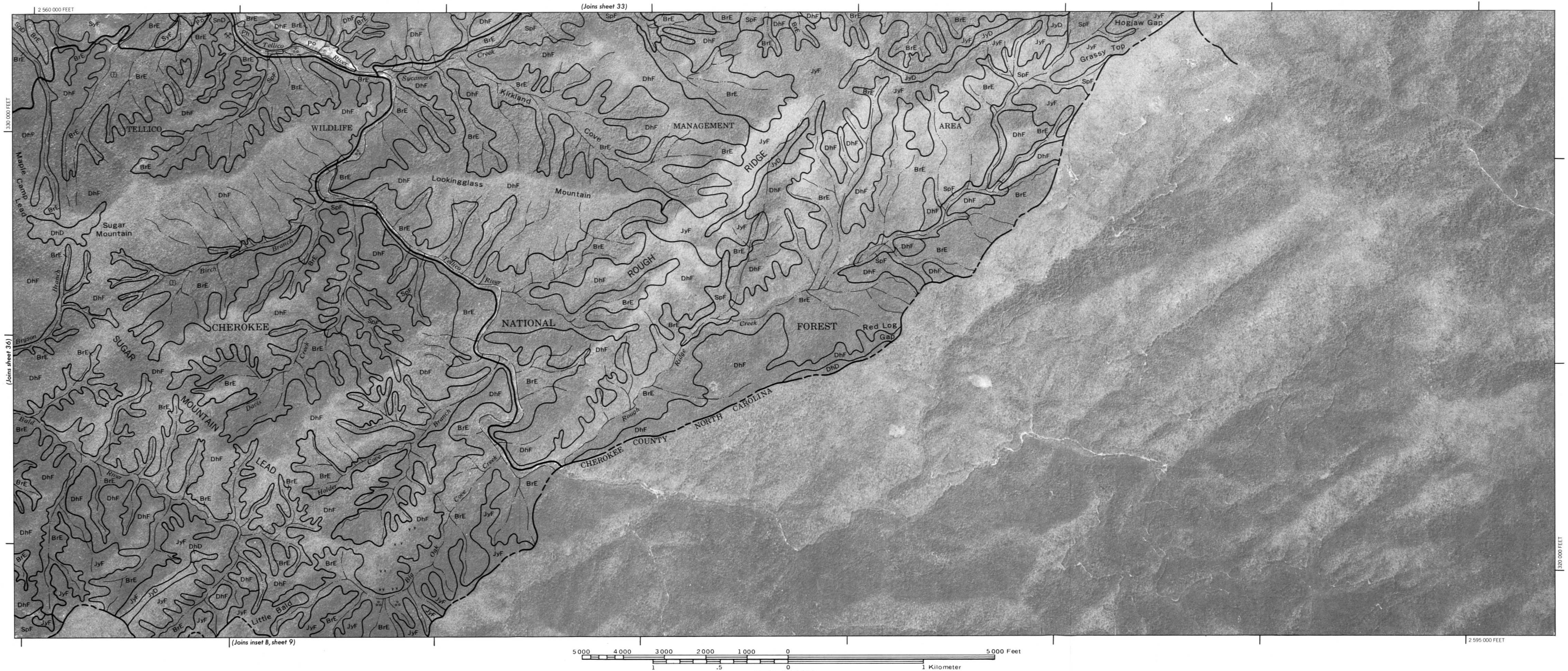
5000 4000 3000 2000 1000 0 5000 Feet

1 .5 0 1 Kilometer

Scale - 1:20000

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

MONROE COUNTY, TENNESSEE — SHEET NUMBER 37



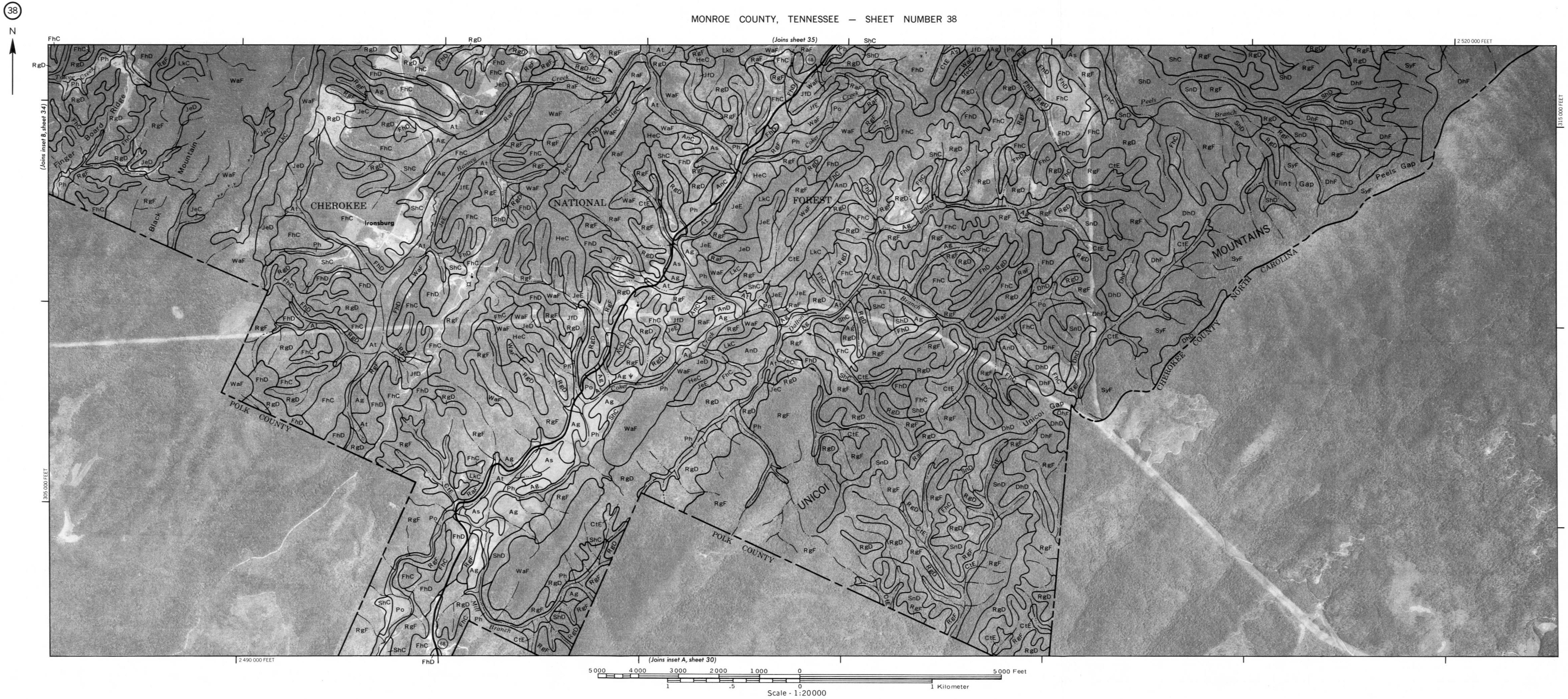
N
2 560 000 FEET
(Joins sheet 33)
(Joins sheet 36)
(Joins inset B, sheet 9)
330 000 FEET
320 000 FEET
2 595 000 FEET
TELLICO
WILDLIFE
MANAGEMENT
AREA
CHEROKEE
NATIONAL
FOREST
ROUGH
RIDGE
SUGAR
MOUNTAIN
LEAD
Tellico River
Sycamore Creek
Kirkland Cove
Lookingglass Mountain
Sugar Mountain
Birch Branch
Maple Camp Lead
Bald River
Davis Creek
Holder Cove
Cove Creek
Big Oak Cove
Little Bald
Rough Ridge Creek
Red Log Gap
Hogjaw Gap
Grassy Top
CHEROKEE COUNTY
NORTH CAROLINA
BrE
DhF
DhD
SpF
JyF
JyD
SyF
SnD
Po
5 000 Feet
5000
4000
3000
2000
1000
0
1 Kilometer
1
.5

Scale - 1:20000

MONROE COUNTY, TENNESSEE NO. 37

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

MONROE COUNTY, TENNESSEE — SHEET NUMBER 38


38
N
(Joins sheet 35)
(Joins inset B, sheet 34)
(Joins inset A, sheet 30)
2 490 000 FEET
2 520 000 FEET
315 000 FEET
305 000 FEET
CHEROKEE
NATIONAL
FOREST
Ironsburg
Tellico Creek
Finger Board Ridge
Black Mountain
Barnes
Coker Creek
Dalton
Ladder
Peels Branch
Flint Gap
Peels Gap
MOUNTAINS
NORTH CAROLINA
CHEROKEE COUNTY
Unicoi Gap
UNICOI
POLK COUNTY
Mill Branch
68
5 000
4 000
3 000
2 000
1 000
0
5 000 Feet
1
.5
0
1 Kilometer
Scale - 1:20000

This map was compiled by U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies on 1975 orthophotography obtained from U.S. Department of the Interior, Geological Survey.

MONROE COUNTY, TENNESSEE NO. 38